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| 13. ABSTRACT (Maximum 200 Words) The Army Experiment III (AE3), sponsored by the Louisiana Maneuvers Task Force (LAM-TF) for the Association of the United States Army (AUSA) demonstration held 14-16 October, 1996 was comprised of the following major components: <ul style="list-style-type: none">• An Immersive Theater• Stand Alone Interactive Displays• A Force Projection Tactical Operation Center (FP TOC) Theater The Immersive Theater demonstrated significant advances in digitization, simulation, and visualization technology and consisted of a story that portrayed tomorrow's Army Information Age tools. This story was told through a series of vignettes linked to the Army Modernization Objectives. The context for the story was a warfighting scenario featuring a Brigade or larger tactical unit. The vignettes featured various distributed experiment elements linked through the AE3 simulation and communication architecture. To the greatest extent possible, the vignettes provided opportunity for interaction by the audience. | | | | |
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1. INTRODUCTION

The Army Experiment III (AE3), sponsored by the Louisiana Maneuvers Task Force (LAM-TF) for the Association of the United States Army (AUSA) demonstration held 14-16 October, 1996 was comprised of the following major components:

- An Immersive Theater
- Stand Alone Interactive Displays
- A Force Projection Tactical Operation Center (FP TOC) Theater

The Immersive Theater demonstrated significant advances in digitization, simulation, and visualization technology and consisted of a story that portrayed tomorrow's Army Information Age tools. This story was told through a series of vignettes linked to the Army Modernization Objectives. The context for the story was a warfighting scenario featuring a Brigade or larger tactical unit. The vignettes featured various distributed experiment elements linked through the AE3 simulation and communication architecture. To the greatest extent possible, the vignettes provided opportunity for interaction by the audience.

Each of the Stand Alone Interactive Displays were designed to accommodate a small number of interactive participants at a time (5 to 10 persons) and reinforced the message provided in the immersive theater. The stand alone displays represented the Army's latest technological advances.

The Force Projection Tactical Operations Center (FP TOC) theater highlighted the demanding requirements for information technologies applicable to the tactical operations center.

The Louisiana Maneuvers AE3 demonstration at the October AUSA Meeting illustrated the demands that will be placed on our warriors in the 21st century battlefield, demonstrating the aspects of 21st century warfare in a distributed virtual battlefield.

1.1 SCOPE

The objectives of AE3 were as follows:

- To display how America's Army is a changing organization that is significantly different from the Cold War Army, and show how the Army is undergoing major re-engineering efforts to address the 21st Century environment.
- To display how America's Army is a learning organization that is always improving, never resting on its laurels, and willing to learn from industry and academia.
- To demonstrate that by leveraging Information Age Technology, America's Army can remain the best Army in the world, capable of land force dominance into the 21st Century. (A key principal is that the experiment was representative of the total Army information technology efforts in Training, Exercises and Military Operations (TEMO), Research, Development and Acquisition (RDA), Advanced Concepts Requirements (ACR), Digitization, and Command, Control, Communications, Computers and Intelligence (C4I)).

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- To display how America's Army, as a steward of our Nation's resources, can leverage the significant modernization investments made over the past decade and focus future modernization efforts on those technologies and systems that will provide the greatest payoff on the battlefield.

This year's experiment expanded on the last year's experiment and focused more on linkage of simulations to C4I systems, the growth of Synthetic Theater of War (STOW) environment from Battalion Brigade Battle Simulation/Modular Semi Automated Forces (BBS/ModSAF) to Corps Level Computer Generated Forces/ModSAF (CLCGF/ModSAF/EAGLE), improvement of stealth view into STOW environment, virtual telepresence and future Command and Control (C2) environments, and demonstrated a more distributed presentation.

2. APPLICABLE DOCUMENTS

The following Documents were used in the preparation of this After Action Report (AAR).

- Statement of work for the LAM Task Force Army Experiment III, 12 March Rev 2.0, 1996.
- ADST II Delivery Order Proposal for Proof of Principal With Mini-FAS for the LAM Task Force Army Experiment III, 24 April 1996.
- Integration & Test Plan for the AUSA Demonstration - OCT, Version 1.0 (Preliminary), 20 June 1996.
- After Action Report for the October AUSA Demonstration 1995, 17 November 1995, Revision 1.0
- Feasibility Analysis Report for LAM Task Force Army Experiment III, 28 June 1996
- Integration and Test Plan for the Army Experiment III, 4 September 1996, revision 2.0

3. AE3 OVERVIEW

AE3 tasking was performed in two distinct parts. Part I consisted of planning and analysis of potential participants in the AUSA Demonstration. Part II consisted of the implementation and integration of the Government selected simulations into the experiment scenario which was written under Government supervision.

3.1 DOCUMENT OVERVIEW

This After Action Report consists of eight major sections: Participants; Requirements; Integration and Test; Immersive Theater Execution; Transportation; Residual Equipment; Lessons Learned (Recommendations) and Program Management. Each section is broken into several sub-sections containing more detailed information. Details are provided in Appendices A through H. The following paragraphs present a top level description for each major section.

3.2 PARTICIPANTS

3.2.1 Overview

The AE3 Participants provided the simulation tools to illustrate the Army's use of information systems in combat development, material development, operational testing, system acquisition, test and evaluation, and training development. The groups that demonstrated these activities are summarized in the following sections and were integrated into the AE3 exhibit at the October '96 AUSA.

3.2.1.1 Long Haul Sites

Long Haul Sites participated interactively in the AE3 scenario via Distributed Interactive Simulation (DIS) Protocol Data Units (PDU's). The Long Haul participants consisted of:

1. Missile Defense Battle Integration Center (MD BIC)
2. Depth & Simultaneous Attack (D&SA) Battle Lab
3. Dismounted Battlespace Battle Lab (DBBL)
4. Joint Virtual Laboratory (JVL)
5. Command and Control Vehicle (C2V)
6. Battlefield Planning and Visualization (BPV)
7. Streamlined Acquisition
8. SIMulation In Training for Advanced Readiness (SIMITAR)

Further detail on each Long Haul participant is provided in section 3.2.2 of this document.

3.2.1.2 Standalone Displays

Standalone Displays were small (approximately 200 square feet) self-contained booths located in the midway of the AE3 exhibit. Their purpose was to highlight a particular advancement in technology which plays an important role in the advancement of 21st Century and to provide a preview and debrief to visitors of the live virtual theaters. The term "Standalone" implies that each display was not a participant in the live simulation exercises presented in the Theaters however, each standalone display did help to further reinforce the message presented in the Immersive Theater and the Force Projection TOC Theater.

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The Standalone Displays consisted of:

1. Logistics Anchor Desk (LAD)
2. Virtual Maintainer (VMAT)
3. Virtual Retinal Display
4. Tele-Medicine
5. Virtual Sand Table (VST)
6. Scout Vehicle
7. Army Enterprise
8. Un-manned Air Vehicle (UAV)
9. Portable Integrated Maintenance System (PIMS)

Further detail on each Standalone Display is provided in section 3.2.3 of this document.

3.2.1.3 Theaters

The AE3 Exhibit housed two live distributed simulation virtual theaters at the October '96 AUSA. Both the Immersive Theater and the Force Projection TOC Theater were designed to seat 50 people each presenting a live 20 minute distributed simulation exercise. The live exercises were phased in each theater such that participants would first be ushered in to view the live 20 minute Immersive Theater exercise and then have 10 minutes to move to the TOC Theater in preparation to view the live 20 minute TOC exercise. Total throughput capacity of AE3 at the AUSA show was calculated as follows:

- $2 \text{ shows / hour} \times 9 \text{ hours / day} = 18 \text{ shows / day}$
- $3 \text{ days} \times 18 \text{ shows} = 54 \text{ total shows}$
- $54 \text{ shows} \times 50 \text{ people / show} = 2700 \text{ visitor throughput.}$

There were eight distributed sites participating in the exercise via the Interim Defense Research and Engineering Network (IDREN) Long Haul Network. The roles these sites played in the exercise as well as their network connectivity are discussed in greater detail in section 3.2.2 of this document. Coordination with the distributed sites, including precise exercise timing and control, was accomplished via voice commands from a single exercise director. The directors voice commands were communicated in digitized packets over the same Long Haul Network supporting the actual distributed simulation exercise. This tightly timed experiment schedule necessitated a rigid distributed exercise which ran without failure for the duration of the experiment.

Figure 3.2-1 depicts the AE3 Sheraton Washington floor plan. The typical flow of participant traffic was as follows: (1) Reception - obtain ticket for live theater presentations, (2) View Immersive Theater exercise, (3) View Force Projection TOC exercise, and (4) Exit live theaters to debriefing area then view Standalone Displays at random.



3.2.2.1 *Missile Defense Battle Integration Center (MD BIC)*

Network Connection: Connected via a dedicated IDREN Connection at SSDC Huntsville Alabama to AUSA.

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Function: Provided Patriot Missile Launch and Destruction of attacking SCUD Missile. The MD BIC provided a computer workstation-based simulation which inserted an Patriot Missile simulation in the exercise.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDU's) to simulate the Patriot Missile in the FP TOC exercise..

Administrative Connection: Interfaced to an administrative phone conference via the Multicast Backbone (M-Bone) (for M-Bone info see 3.4.1.2) portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing (VTC): No participation in the Live VTC portion.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.2 Depth & Simultaneous Attack (D&SA) Battle Lab

D&SA was a Long Haul networked participant located in Fort Sill, Oklahoma.

Network Connection: Connected via a Defense Simulation Internet (DSI) connection to the IDREN connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the FP TOC scenario.

Function: Provided ATACMS Missile Launch and Destruction of enemy SCUD TEL Forward Operating Base (FOB). The D&SA provided a computer workstation-based simulation which inserted an Attack Missile simulation in the exercise.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDU's) to simulate the ATACMS in the FP TOC exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: No participation in the Live VTC portion.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.3 Dismounted Battlespace Battle Lab (DBBL)

DBBL was a Long Haul networked participant located in Fort Benning Georgia.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

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Function: Provided insertion of the 21st Century Land Warrior Simulation (a Dismounted Infantryman man-in-the-loop simulation) in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the Dismounted Infantry in the Immersive Theater exercise..

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point Integrated Services Digital Network (ISDN) connection providing a live Video-teleconference feed of the SAFOR Operators in the simulator at Fort Leavenworth. The live SAFOR Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the McKenna MOUT visual databases in the AE3 provided by TEC.

3.2.2.4 Joint Virtual Laboratory (JVL)

JVL was a Long Haul networked participant located in Fort Leavenworth, Kansas.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of Semi-Automated Forces (SAFOR) entity participation in the live Immersive Theater demonstration including EAGLE, ModSAF, CLCGF and ITEMS systems. These systems are all based on various computer workstations which populate the simulation exercise with entities that behave and respond realistically to their immediate situation within the battle.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the SAFOR entities in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a point-to-point ISDN connection providing a live Video-teleconference feed of the SAFOR Operator at Fort Leavenworth. The live SAFOR Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.5 Command and Control Vehicle (C2V)

The C2V was a Long Haul networked participant located in Fort Leavenworth, Kansas.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

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Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of Command and Control Vehicle entity participation in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the C2V in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point ISDN connection providing a live Video-teleconference feed of the C2V the Simulator Operator at Fort Leavenworth. The live C2V Simulator Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.6 Battlefield Planning and Visualization (BPV)

The BPV simulation required both a distributed and on-site components. The networked portion of BPV was co-located with the JVL at Fort Leavenworth, Kansas. The on-site portion of BPV was located at the AUSA site providing BPV visuals to the AE3 experiment which were ultimately displayed in the Immersive Theater.

Network Connection: Connected via an IDREN connection installed specifically for AE3 connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided visualization of the BPV tool as it participated in the live Immersive Theater demonstration. The BPV is a computer workstation which provides the user with a real-time updated graphical view of Battlefield entity locations and status in aggregated and deaggregated formats.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the BPV in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: No Live Video Teleconference participation.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.7 Streamlined Acquisition

Streamlined Acquisition was a networked participant located in San Jose, California.

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Network Connection: Connected via a dedicated T1 leased connection interfaced to the IDREN at Fix-West connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided insertion of a prototype Bradley Vehicle simulator in the live Immersive Theater demonstration. The simulated vehicle was integrated with computer-based design equipment demonstrating that designers can use a step-by-step process to model and test new designs in simulation, correcting problems before fabricating the actual hardware.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the Bradley vehicle in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a point-to-point ISDN connection providing a live Video-teleconference feed of the Streamlined Acquisition Lab at United Defense in San Jose, California. A live United Defense Engineer addressed the audience in the theater explaining the United Defense Streamlined Acquisition concept.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

3.2.2.8 Simulation In Training for Advanced Readiness (SIMITAR)

The SIMITAR simulation was a distributed participant in the AE3 and was located in Bozeman, Montana.

Network Connection: Connected via a DSI to IDREN connection, connecting ultimately to the AUSA.

Exercise Participation: Interacted in the exercise as a live participant in the Immersive Theater scenario.

Function: Provided visualization of a scout vehicle entity in the live Immersive Theater demonstration.

Distributed Simulation Protocol: Utilized Distributed Interactive Simulation (DIS) compliant Protocol Data Units (PDUs) to simulate the scout vehicle in the Immersive Theater exercise.

Administrative Connection: Interfaced to an administrative phone conference via the M-Bone portion of the Long Haul Network. This connection was used to provide exercise control allowing coordination of all networked participants.

Video Teleconferencing: Interfaced to the AUSA via a Point-to-point ISDN connection providing a live Video-teleconference feed of the SIMITAR Simulator Operator at Bozeman. The live SIMITAR Simulator Operator video was displayed in the Theater.

Support: Utilized a GFE copy of the Chorwon Korea visual databases in the AE3.

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3.2.3 Standalone Displays Participation

3.2.3.1 Logistics Anchor Desk (LAD)

The LAD was used in the FP TOC Theater to demonstrate improvements in the application of information technologies as they apply to real-time Logistics control on the battlefield. The LAD was used by the commanding officer in the FP TOC Theater exercise to electronically review and allocate inventory of supplies and equipment on the battlefield during the scenario.

LAD was also featured in a portion of the Immersive Theater scenario to show the same utility as in the FP TOC. The Immersive Theater portion was videotaped prior to the AE3 demonstration. Lockheed Martin supplied the equipment and personnel used to videotape the LAD portion of the theater scenario.

3.2.3.2 Virtual Maintainer (VMAT)

The VMAT was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VMAT is a computer-based personal assistant that helps the Army mechanic to troubleshoot faulty equipment. VMATS virtual reality allows the mechanic to interact with simulated weapons systems and test equipment.

VMAT provided spoken dialogue-based maintenance assistance in an interactive virtual environment. VMAT incorporates a natural language processor and a diagnostic expert system on a Pentium-based personal computer to provide cost-effective realistic visualization and diagnostic assistance.

The VMAT application provides diagnostic instruction and assistance for replacing and replacement units by M1A1 organizational-level mechanics. The virtual environment includes the M1A2 Abrams tank and Simplified Test Equipment (STE). VMAT's modular design easily adapts to other applications.

VMAT required the following equipment and services from Lockheed Martin:

- Floor space: 7' x 2.5'
- Power: 2 x 110 Volts, 20 amps each.
- Network Connections:
 - One 128 Kbps ISDN data line to Huntsville,
 - Two Data POT lines,
 - Two Voice POT Lines.
- Two 37" NTSC monitors .

3.2.3.3 Virtual Retinal Display

The Virtual Retinal Display (VRD) was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VRD is a new and innovative method of displaying information. It creates an image directly on the human eye by scanning a pinpoint beam of light in a precision pattern on the Retina.

The VRD, an enabling technology for personal visual displays, can enhance situational awareness, communications, and overall effectiveness of the information-intensive military applications. This device

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offers unique advantages over conventional display technologies in image resolution, contrast ratio, brightness and power consumption.

Possible defense applications include ground and airborne situational awareness; immersive viewing for simulations and training; portable aids for telemedicine and telemaintenance; and high resolution displays for tactical, operational, and C4I missions.

Virtual Retinal Display required the following equipment and services from Lockheed Martin:

- Floor Space: 10' x 10'.
- Power: 2 x 110 Volts, 20 Amp each.

3.2.3.4 Tele-Medicine

Telemedicine was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The Telemedicine concept is a Army Medical Department initiative to support casualty care to reduce mortality and morbidity in the future battlefield. These technologies support soldiers and will reengineer health-care delivery concepts for the battlefield in the year 2000 and beyond. Telemedicine was composed of the five displays described below:

3.2.3.4.1 MediTag

Meditag is a low-cost, high-volume, information technology device that can store an individuals entire medical history (text, data, images, video and audio) on a rugged 2 inch x 3/4 inch dog tag like device. Sample MediTags were displayed at the AE3 exhibit.

MediTag required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 6'.
- Power: 1 x 110 Volts, 20 Amp total.

3.2.3.4.2 Life Support for Trauma & Transport (LSTAT)

The LSTAT is a self-contained intensive care unit for transporting and monitoring seriously injured or ill patients. Because the casualty stays on the same litter with the same life support equipment, medical care is seamless from the rugged battlefield to the hospital facility.

Each unit has a mechanical ventilator, oxygen generator, suction device and environmental control canopy fitted on a NATO litter. An actual LSTAT prototype was displayed at the exhibit.

LSTAT required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 10'.
- Power: 1 x 110 Volts, 20 Amp total.

3.2.3.4.3 MediCam

MediCam is a soldier-mounted camera that allows video and audio communications between the battlefield and the physician. An actual MediCam was demonstrated at the AE3 exhibit.

MediCam required the following equipment and services from Lockheed Martin:

- Floor Space: 4' x 6'.
- Power: 1 x 110 Volts, 2 Amps total.

3.2.3.4.4 3D Ultrasound

The 3-D Ultrasound device helps field doctors and nurses to quickly pinpoint internal injuries. This device's telemedicine capabilities allow consultation with expert physicians worldwide. This device also allows the medic to consult with the physician in diagnosing and treating the patient at the onset of injury. An actual 3-D Ultrasound device was displayed at the AE3 exhibit.

3D Ultrasound required the following equipment and services from Lockheed Martin:

- Floor Space: 6' x 6'.
- Power: 1 x 110 Volts, 6 Amps total.
- One Dial out phone

3.2.3.4.5 Virtual Sand Table

The Virtual Sand Table (VST) was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The VST helps commanders and their staffs conduct the current battle and prepare for the future battle. The VST projects a stereo image on a table top and allows the commander to interact with the display through voice commands and hand gestures. Along with the digitization and situational awareness envisioned in Force XXI, the VST will be the commander's window into the current battle.

The VST also facilitates initial planning (including course of action (COA), development and analysis), rehearsals, and contingency planning. Staffs wargame on an accurate three dimensional representation of the area of operations using a familiar, sand-table-like paradigm.

Virtual Sand Table required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- Power:
 - 3 x 110 Volts @ 15 Amps each,
 - 1 x 220 Volts @ 20 Amps each (L6-20 plug).
- Network Connection: 10BaseT to Virtual Sand Table
- Three standard 5 foot tables with skirts
- Two (2) standard office chairs.
- One Dial out phone

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3.2.3.5 Scout Vehicle

The Scout Vehicle was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The Scout Vehicle reconfigurable simulator demonstrated the concepts and requirements that may be required of a future scout vehicle. Future technology was simulated in this system and included improved sensors and data fusion will allow the scout to rapidly identify, locate, and report information; thus extending the commanders vision of the tactical situation. Scout Vehicle required the following equipment and services from Lockheed Martin:

- Floor Space: 12' x 15'.
- Power:
 - 5 x 110 Volts @ 20 Amps each
 - 2 x 220 Volts @ 20 Amps each (L6-30R plug).
- Network Connection: 10BaseT to Scout Vehicle
- One standard 6 foot table with skirt.
- One Dial out phone

3.2.3.6 Army Enterprise

The Army Enterprise display was a series of 6 live interactive systems which were demonstrated to AE3 visitors during the AUSA show. The systems are parts of the Army Battle Command System (ABCS) which built on the Army Enterprise architecture of common technical standards, doctrinal integrity, and systems interoperability. The Army Enterprise strategy is a single unified vision for the Army C4I community focusing on joint and combined interoperability and serves as the enabler for land force dominance. The ABCS systems on display at the AE3 exhibit were:

- Army Global Command and Control System (AGCCS);
- All Source Analysis System (ASAS);
- Battlefield Planning and Visualization (BPV);
- Combat Service Support Control System (CSSCS);
- Maneuver Control System/Phoenix (MCS/P);
- Appliqué.

Each of these computer workstation-based systems reinforced the FP TOC theater message. (Duplicate systems played an integral role in the live FP TOC theater exercise.)

Army Enterprise required the following equipment and services from Lockheed Martin:

- Floor Space: 20' x 45'.
- Equipment Enclosures
- One Dial out phone

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- One 60" Hi Res Monitor
- Four 20 amp power circuits
- Six 21" video monitors.

3.2.3.7 Unmanned Air Vehicle (UAV)

The UAV was a live interactive simulation system which was demonstrated to AE3 visitors during the AUSA show. The UAV simulation display illustrated how the simulation is used to determine UAV requirements and to help develop concepts for operational employment. It demonstrated how prototype systems are integrated through simulations and how man-machine interfaces are enhanced and refined to provide feedback to material developers for system upgrades.

UAV required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- Power: 2 x 220 x 20 amp circuits, 5 x 110 x 20 amp circuits
 - Network Connection: Internet Access via IDREN
- Three 37" Composite Video monitors.
- One out calling phone
- Four standard 5 foot tables
- Shelf for 3 Personal Computers
- Two (2) standard office chairs.

3.2.3.8 Portable Integrated Maintenance System (PIMS)

The PIMS was a live interactive system which was demonstrated to AE3 visitors during the AUSA show. The PIMS integrates several advanced technology thrusts that combine video mentoring, logistics internet, wearable computer systems and weapon systems prognostics/diagnostics. The PIMS maintainer can use various tools that were previously unavailable. The PIMS maintainer is electronically linked with the information needed to help complete the mission effectively. These tools include instant video and audio access to subject matter experts located anywhere in the world, interactive electronic technical manuals, and logistics health data from the weapon system itself. All the information is presented in an easy to use nonobtrusive wearable system.

PIMS required the following equipment and services from Lockheed Martin:

- Floor Space: 8' x 10'.
- One out calling phone

3.2.4 Theaters

3.2.4.1 Immersive Theater

The Immersive Theater provided an environmentally controlled viewing area for AE3 visitors to witness the AE3 simulation scenario. The AE3 scenario script appears as an appendix in this document. A combination

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of live networked simulations, pre-recorded presentations and video teleconference (VTC) feeds were fused and displayed on a 30 foot wide by 10 foot high projection screen. The live networked simulations transmitted DIS PDU's across the simulation network to the AUSA ballroom. The PDU's were decoded by 4 different computer Image Generators (IG's), supplied by Silicon Graphics Inc., which visually rendered the simulated imagery. In addition, there were over 20 computer-based workstations supplying processing and visualization elements. A total of 30 video feeds (IG's and Workstations) were interfaced to a 32 x 6 video switching matrix control system which controlled which of the video feeds were displayed on the screen in the theater in real-time.

The Immersive Theater was composed of the following subsystems:

- Enclosure Subsystem (A physical enclosure which provided an acoustically and visually controlled viewing area).
- Audience Seating Subsystem (A tiered floor with seating for the audience)
- Visuals Subsystem (Produced the Stealth and Out The Window (OTW) views to support the presentation of the scenario in the theater.)
- Display Subsystem (Visual displays used to present visual segments of the scenario to the audience)
- Audio Subsystem (A loudspeaker system that presented the audio portion of the scenario to the audience)
- Lighting Subsystem (Provided ambient and scenario related lighting within the theater)
- Live Video Feed Subsystem (Interfaced the live video feeds from the distributed participants to the Switch Subsystem)
- DIS Audio Subsystem (Decoded DIS Audio PDUs and interfaced them to the Switch Subsystem)
- Recorded Audio/Video Subsystem (Recorded Audio/Video clips used for non-networked portions of the theater scenario.)
- Recorded PDU Subsystem (Recorded PDU traffic for use in the event of Long Haul Network disruption.)
- Switch Subsystem (Switched the multiple audio and video inputs to the Display and Audio Subsystems)
- Intercom Subsystem (Provided communications between technicians running the theater and the distributed participants)
- Local Node Subsystem (Consisted of local nodes of networked participants [BVP, LWSE, ASAS, MCSP, and ModSAF])

LAN Subsystem (Provided connectivity between networked subsystems, and between the Immersive Theater and the Long Haul Network.)

Figure 3.2.18-1 shows a decomposition of the Immersive Theater into functional subsystems.

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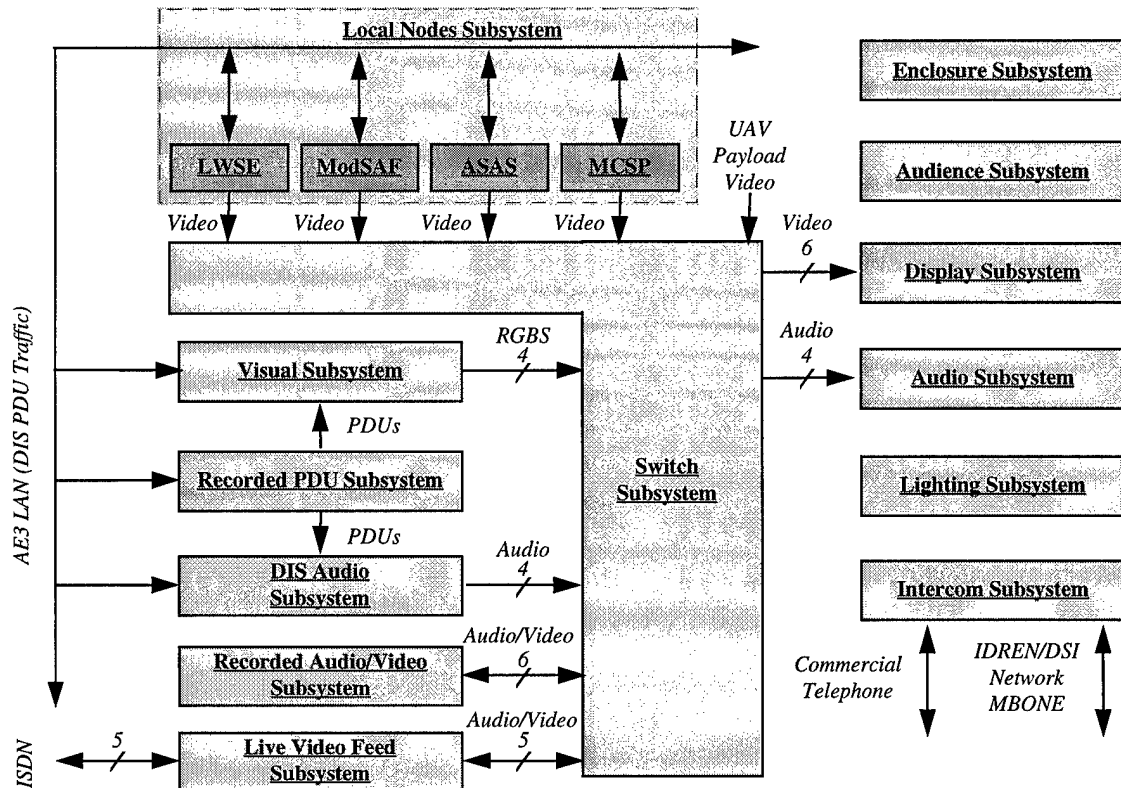


Figure 3.2.17-1 Immersive Theater functional block diagram

3.2.4.2 Force Projection - Tactical Operations Center (FP TOC)

The FP TOC provided an environmentally controlled viewing area for AE3 visitors to witness the AE3 FP TOC demonstration. A combination of live networked simulations and pre-recorded presentations were fused and displayed on two 35 inch high-resolution monitors. The live networked simulations transmitted DIS PDU's across the simulation network to the AUSA ballroom. The PDU's were decoded by 2 different computer Image Generators (IG's), supplied by Silicon Graphics Inc., which visually rendered the simulated imagery. In addition, there were 12 computer-based workstations on the FP TOC theater stage supplying processing and visualization elements. A total of 18 video feeds (IG's and Workstations) were interfaced to a 18 x 2 video switching matrix control system which controlled which of the video feeds were displayed on the two monitors in the theater in real-time.

The FP TOC Theater was composed of the following subsystems:

- Enclosure Subsystem (A physical enclosure was provided with an acoustically and visually controlled viewing area).
- Audience Seating Subsystem (A tiered floor with seating for the audience)
- Display Subsystem (Visual displays used to present visual segments of the scenario to the audience)
- Audio Subsystem (A loudspeaker system presented the audio portion of the scenario to the audience)
- Lighting Subsystem (Provided ambient and scenario related lighting within the theater)
- Recorded Audio/Video Subsystem (Recorded Audio/Video clips used for non-networked portions of the FP TOC scenario.)
- Recorded PDU Subsystem (Recorded PDU traffic for use in the event of Long Haul Network disruption.)
- Switch Subsystem (To switch the multiple audio and video inputs to the Display and Audio Subsystems)
- Intercom Subsystem (Provides communications between technicians running the FP TOC and the distributed participants)
- FP TOC Subsystem (Consisted various FP TOC workstations)
- LAN Subsystem (Provided connectivity between networked subsystems, and between the FP TOC and the Long Haul Network.)

Figure 3.2.18 shows a decomposition of the FP TOC into functional subsystems.

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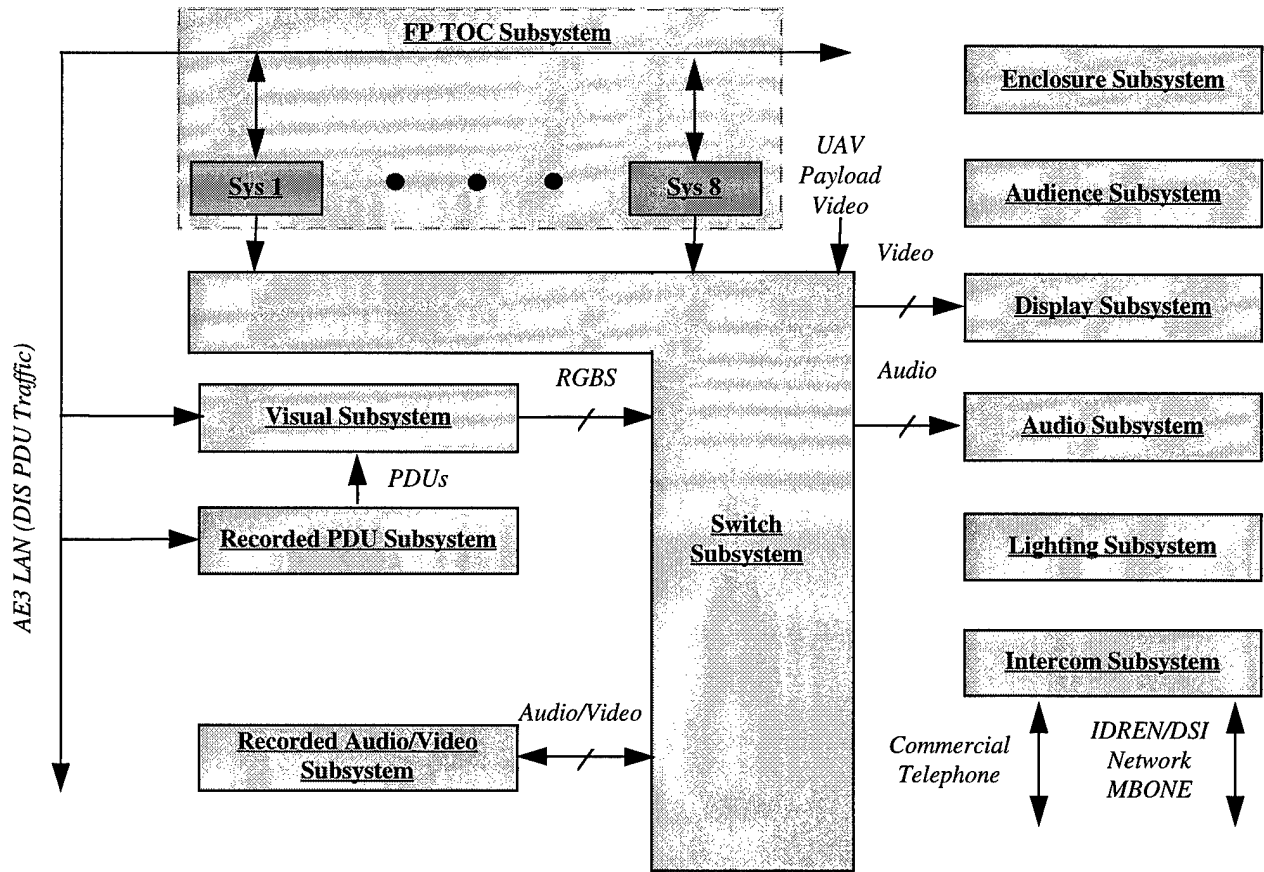


Figure 3.2.18-1 FP TOC functional block diagram

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3.3 AUSA SHOW PRODUCTION

To prepare for and produce AE3 required coordination of multiple tasks. This section will summarize these tasks and detail the issues that needed to be addressed in preparation for and production of Army Experiment 3 at the 1996 October AUSA.

3.3.1 Hotel and Union Labor

Lockheed Martin contracted with the Sheraton Washington Hotel and Greyhound Exposition Services (GES) for services required to prepare the Cotillion Ballroom for Army Experiment III. These services included air conditioning, electrical power, telephone connections, network connections, tables, draping, and labor for installation, dismantling, and handling of equipment (unloading and loading trucks).

3.3.2 AE3 Teardown Pack and Ship

The planning for teardown packing and outbound shipping was discussed in detail during IPR's 8&9. The final plan was executed on the last day of the demonstration, Wednesday 16 October. Lockheed Martin discussed with each participant in the LAM TF booth, the procedures of outbound shipping. All Standalone Displays were packed and shipped by 10:30 p.m. Wednesday 16 October. The equipment was delivered to Wares United Van Lines warehouse. The outbound choices from Wares were: Wares Van Lines (regular freight out); Federal Express (charged to the participant); participant pick-up. All LAM TF ADST II items were tagged for later inventory.

The day after the demonstration, Thursday 17 October, all equipment was packaged in it's original crates or boxes. All equipment was crated and packaged in a safe and secure manner to prevent any damage during shipment. All Equipment was packed and not shipped loose. The equipment retained it's original crate number for tracking.

3.3.3 Heating Ventilation Air Conditioning (HVAC)

Lockheed Martin provided a power and cooling requirements analysis for AE3 computer equipment. Based on that analysis, the appropriate cooling services were contracted with the Sheraton. The supplemental HVAC required for the immersive and FP TOC theaters was supplied by Exhibit Crafts Inc. (ECI).

3.3.4 Power

Lockheed Martin provided a power requirements analysis (see Appendix E for power analysis) for all elements of the AUSA. Based on that analysis, the appropriate power services were contracted with the Sheraton. The requirements were for three separate sources of power. The exact placement and type of each power outlet on the Sheraton Ballroom floor was documented by Lockheed Martin on a CAD power distribution drawing. Copies of this drawing were supplied to Exhibit Crafts Inc. and the Sheraton subcontractors. ECI made provisions in the design of the exhibit structure for running power. The Sheraton Hotel was responsible for installation of the power on the floor and used the CAD drawing as a guide for placement of the power laydown prior to installation of the exhibit structure. The physical power distribution is shown in Figure 3.3.4-1.



The LAM TF stand alone displays and theater were installed and integrated into the Cotillion Ballroom. Section 3.2 describes each participant and Figure 3.2-1 illustrates the floor plan in for the AE3 demonstration.

Lockheed Martin arranged for 1-800 dial-up teleconferencing telephone service between the distributed sites and both the Test facility (ARL) and the Cotillion Ballroom to be used for ancillary administrative control of the scenarios. This service was used extensively during Integration and Test as well as during the AUSA show to troubleshoot the live scenario and provide a means of conferencing multiple participants at distributed sites. This method of test proved invaluable in the months leading up to and including actual execution of the AE3 in Washington. Figure 3.3.6-1 summarizes the 1-800 dial-up teleconferencing utility:

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AUSA Teleconference Backup

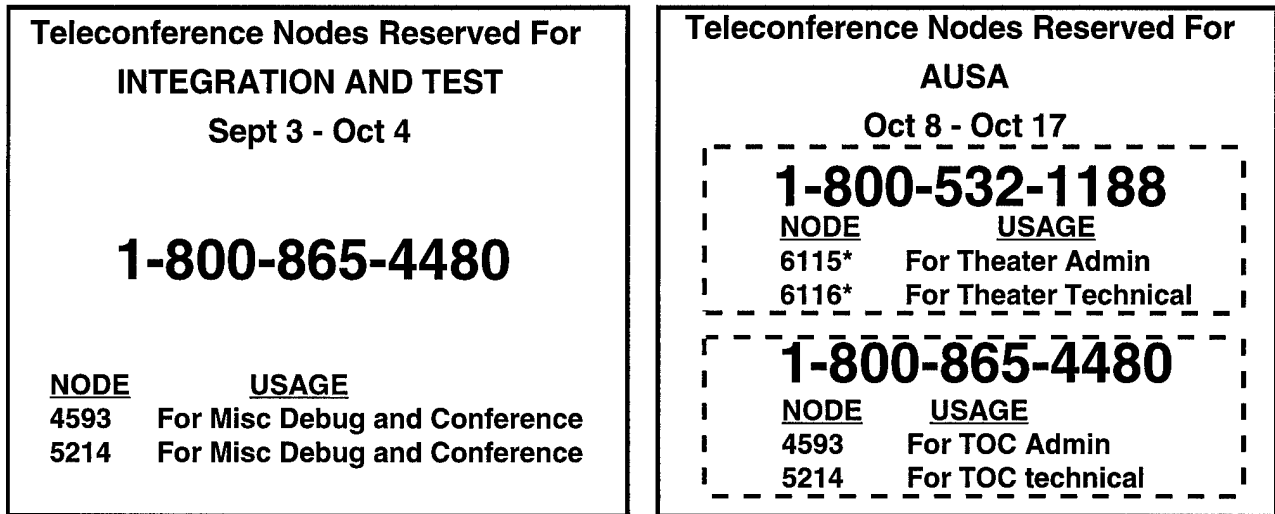


Figure 3.3.6-1 AE3 1-800 Dial-Up Teleconference Utility

Figure 3.3.6-2 represents the logical teleconference grouping that was utilized during interim integration & test and the AE3 demonstration. The teleconferencing method varied between using the M-Bone and AT&T 1-800 dial up service (para 3.3.6).

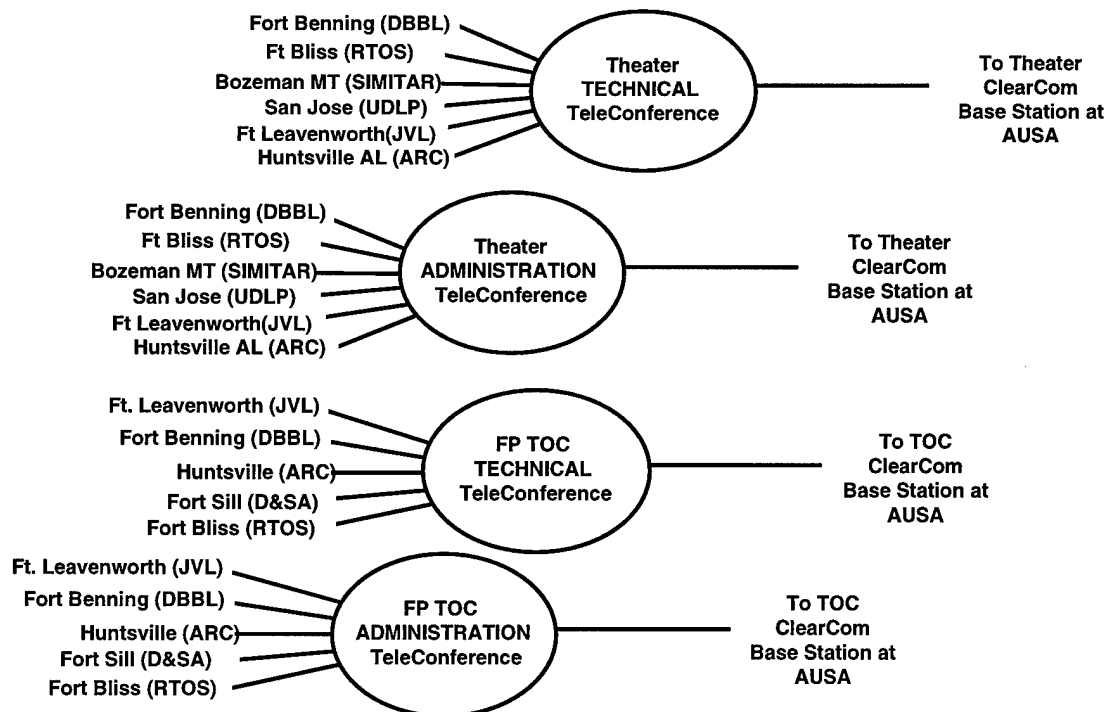


Figure 3.3.6-2 AE3 Logical Teleconference Groupings

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Lockheed Martin provided Pagers for key participants during the AE3 integration period. The Pagers provided 1-800 Nationwide service with Voice Mail to facilitate instant access to resolve integration issues. The pagers were assigned to individuals as shown in Table 3.3.6-3.

| Last Name | First Name | Beeper Phone Num |
|-----------|------------|------------------|
| Eriksson | Karl | 1-888-612-9403 |
| Bryant | Bob | 1-888-612-9226 |
| To | Virginia | 1-888-612-9250 |
| Dykstra | Phil | 1-888-612-9200 |
| Kile | Tom | 1-888-612-9401 |
| Ksel | Jan | 1-888-612-9258 |
| LTC Smart | Tom | 1-888-612-9212 |
| Edwards | Bob | 1-800-528-0799 |
| Campbell | John | 1-800-549-3213 |
| Neuman | Stephanie | 1-800-528-0803 |
| Brown | Kirby | 1-800-915-7352 |
| Kalaf | Mike | 1-800-474-5516 |
| Helgesson | Ulf | 1-800-309-4238 |
| Hutton | Bob | 1-800-329-7764 |
| Floater | AE3 Show | 1-888-612-9223 |
| Floater | AE3 Show | 1-888-612-9228 |
| Floater | AE3 Show | 1-888-612-9201 |
| Kubik | Randy | 1-800-558-6312 |
| Umbarger | Jeff | 1-800-238-7692 |

Table 3.3.6-3 AE3 Pager Assignments

3.3.7 Telephones/DataFax/2-Way Radios

Lockheed Martin ordered and supplied dial-up telephone services, instruments and 2-Way radios for administrative use in the Ballroom area. The telephones were used for any general telecommunications requiring communication through plain telephone lines. There were two phone lines installed in the kitchen area of the Cotillion Ballroom for voice and fax (the kitchen area was a convenient area which was utilized as the administrative area for management meetings and planning). LAM TF supplied a BROTHER FAX/Copier/Printer in the kitchen and utilized this unit for administrative purposes. The analog instrument for the immersive theater tech room phone #2 & #3 and the receptionist front desk phone # 15 was replaced with 900 Mhz cordless phones.

Figure 3.3.7-1 represents the logical distribution of analog telephone lines throughout the Cotillion Ballroom.

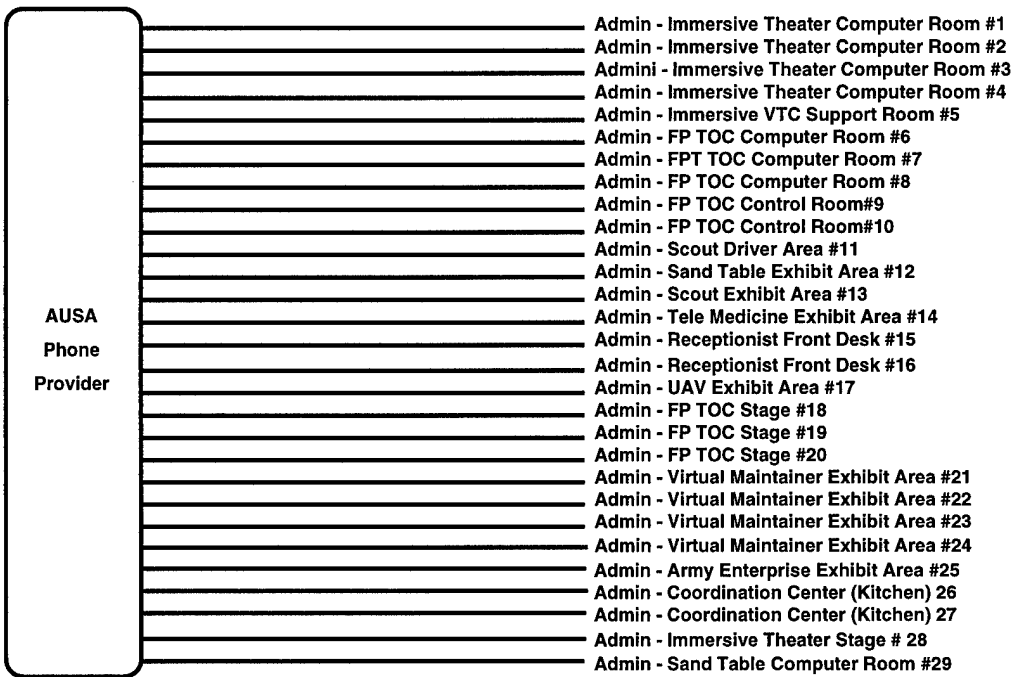


Figure 3.3.7-1 AE3 Logical Telephone Distribution

Hand held 2-Way radios were used extensively at the AE3 (through installation, integration and the demonstration.). Key people were identified who were involved in onsite AE3 installation and integration and needed to be available on-call. Figure 3.3.7-2 depicts the distribution of hand held 2-way radios.

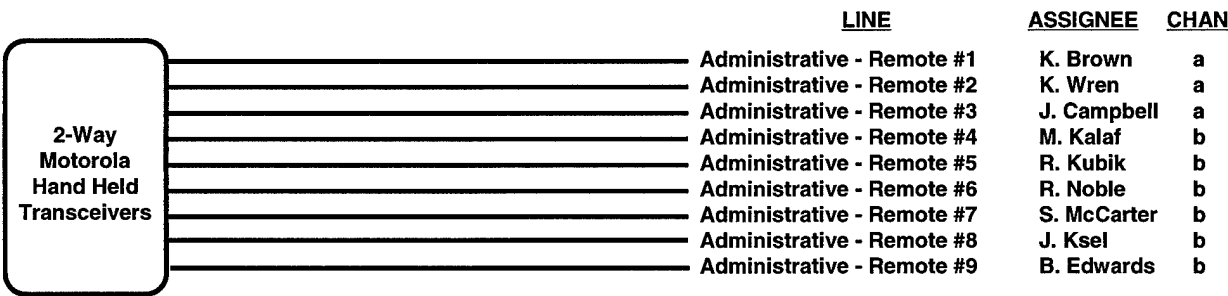


Figure 3.3.7-2 AE3 2-Way Radio Assignment

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Figure 3.3.7-4 represents the distribution of the local communication Clear Comm headsets. This configuration was used for the interim integration & test and at the AE3 demonstration.

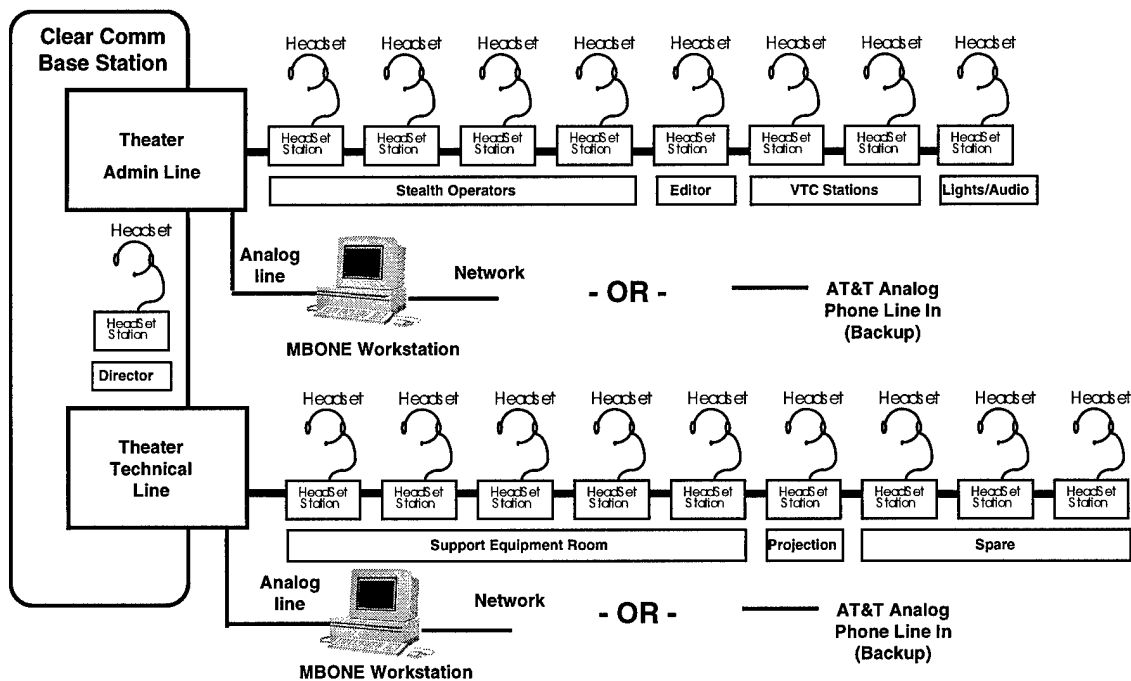


Figure 3.3.7-4 Clear Comm Distribution

3.3.8 Exhibit Support

3.3.8.1 Perimeter Drapes

Lockheed Martin arranged, through a Exhibit Crafts Inc. (ECI) to supply black perimeter drapes for the AUSA at the Cotillion Ballroom. (ECI) contracted with Greyhound Exposition Services (GES) to lease and install the black curtains.

3.3.8.2 Furniture

Lockheed Martin arranged for all custom furniture to be designed and built by Exhibit Crafts Inc. Folding tables and chairs were provided by the Sheraton.

3.3.8.3 Immersive Theater

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, an appropriate ramp, audience seating and the design of the enclosure for the Immersive theater including lighting, audio system (public address), sound deadening, and video projection systems.

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3.3.8.4 Carpet

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, appropriate carpeting for both theaters and the Cotillion Ballroom.

3.3.8.5 FP TOC

Lockheed Martin arranged for, through ECI, based on designs received from the Exposition Conceptual Designer, an appropriate ramp, audience seating and the design of the enclosure for the FP TOC theater including lighting, audio system (public address), sound deadening, and video projection systems.

3.3.9 AE3 Network Communications

Figure 3.3.9-1 depicts the logical communications topology for AE3 networked participants.

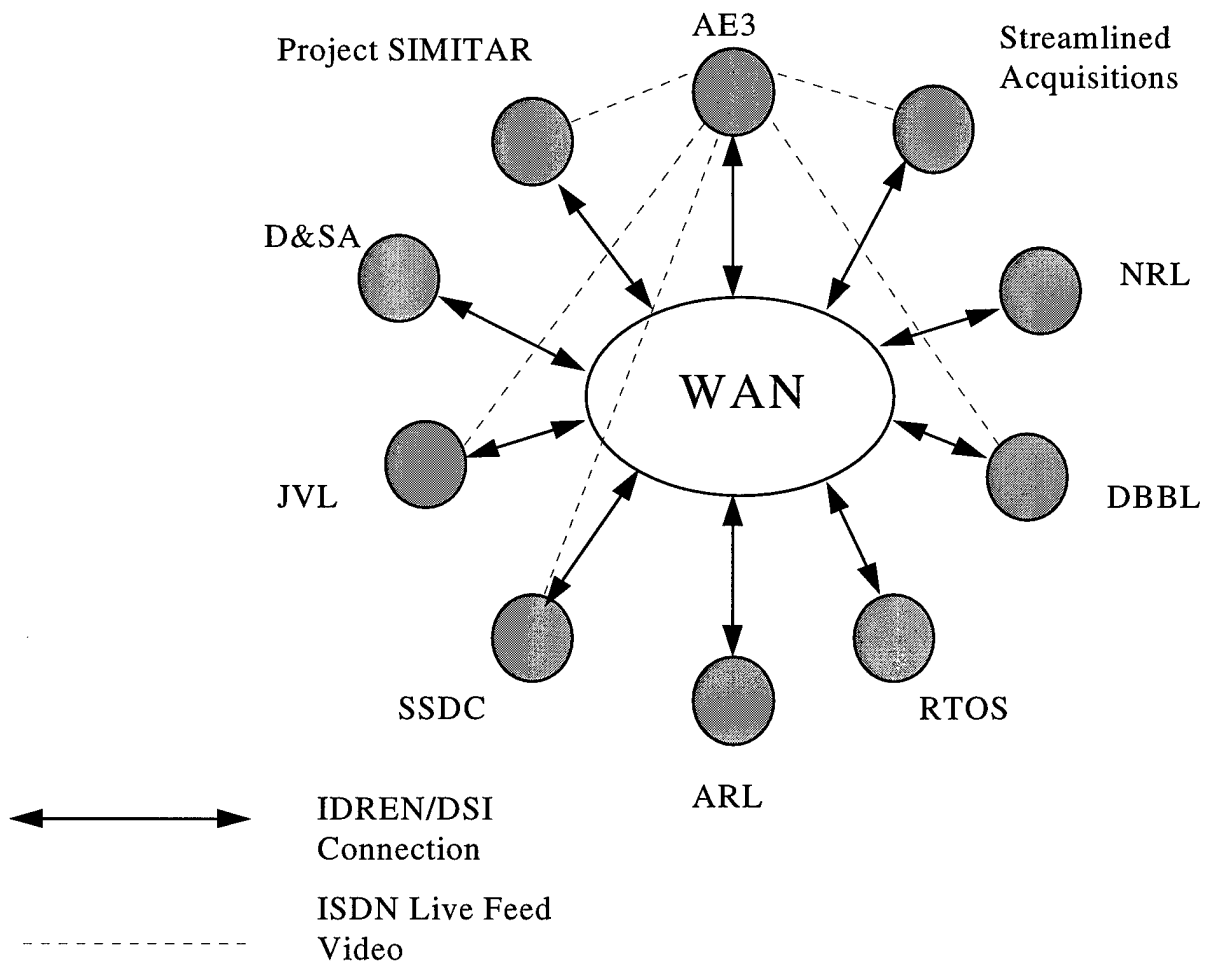


Figure 3.3.9-1 Logical Communications Topology for AE3 Networked Participants

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3.3.9.1 Integrated Services Digital Network (ISDN)

ISDN network lines are required to carry the signal between two sites conducting a Video Teleconference (VTC). Five sites participated in the AE3 via live VTC. This necessitated lease of ISDN lines and associated air time by Lockheed Martin. Lockheed Martin arranged for, through local phone companies, ISDN lines per the following schedule: For the period 6 September 1996 through 31 October 1996 connections were made from the distributed sites listed below to:

Lockheed Martin
12506 Lake Underhill Road
Orlando, FL 32825

Distributed Sites:

United Defense LP
1115 Coleman Ave
San Jose, CA 95103
POC: Don Cahalan 408.289.2744

Land Warrior Test Bed
Building 2866 (Cross Connect at Building 479)
Way Street
Fort Benning, GA 31905
POC: Jim Morris 706.682.5300

US Army TRAC
Attn: ATRC JVL
Funston Hall
Fort Leavenworth, KS 66027
POC: Gene Pal 913.684.7569

Project SIMITAR
24 W. Menden Hall
Bozeman, MT 59771
POC: Dan Rose 406.444.6969

For the period 9 October 1996 through 31 October 1996 connections were made from the distributed sites to:

The Cotillion Ballroom
Sheraton Washington
2660 Woodly Rd at Connecticut Ave NW
Washington, DC 20008
POC: Mike Looney 202.328.5600

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Distributed Sites:

United Defense LP
1115 Coleman Ave
San Jose, CA 95103
POC: Don Cahalan 408.289.2744

Land Warrior Test Bed
Building 2866 (Cross Connect at Building 479)
Way Street
Fort Benning, GA 31905
POC: Jim Morris 706-682-5300

US Army TRAC
Attn: ATRC JVL
Funston Hall
Fort Leavenworth, KS 66027
POC: Gene Pal 913.684.7569

Project SIMITAR
24 W. Menden Hall
Bozeman, MT 59771
POC: Dan Rose 406.444.6969

SSDC
Huntsville, AL
POC: Kelvin Nunn 205.842.6529

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A summary of the points of contact for ISDN service is contained in the Table 3.3.9.1-1.

| Connect ion Type | Start Date | End Date | Time | BW | Location | Carrier | Carrier POCs |
|--------------------|----------------------------------|----------|------|-----------------|---|-----------------------|--|
| ISDN | 10/9/96 | 10/17/96 | NA | 1 line 2B+D | Huntsville | AT&T already in place | Kelvin Nunn 1-205-842-6529 John Smith 1-205-876-1802 |
| ISDN | 8/23/96 | 10/31/96 | NA | 1 line 2B+D | DBBL | Bell South | Ann Downing 1-407-245-2032 |
| ISDN | 9/3/96 | 10/31/96 | NA | Switch 56 | Proj. Simitar | US West | Shirley Poglaze 1-801-237-8877 |
| ISDN | 8/20/96 | 10/31/96 | NA | 1 line 2B+D | Streamlined Acquisitions (United Defense) | Pacific Bell | Kathy Pizzillo 1-213-975-4089 Dave Olsen 1-213-975-2877 |
| ISDN | 8/19/96 | 10/31/96 | NA | 1 line 2B+D | JVL/TRAC | South Western Bell | Sheri Lux 1-800-229-3214 |
| ISDN | 8/30/96 | 10/15/96 | NA | 4 lines 2B+D | LMC | Bell South | Ann Downing 1-407-245-2032 |
| ISDN | 10/1/96 (D-Mark) 10/10 (Show) | 10/31/96 | NA | 5 lines 2B+D | Sheraton, D.C. | Bell Atlantic | Dottie Price 1-301-595-2215 Andre Granderson 1-301-595-2216 |
| ISDN Long Distance | 8/28/96 | 10/31/96 | NA | NA | All Locations | Sprint | Brenda Wagner 1-610-660-3971 |

Table 3.3.9.1-1 ISDN Points of Contact

3.3.9.2 Interim Defense Research Engineering Network (IDREN)

ARL had overall responsibility for the design and implementation of the IDREN portion of the Long Haul Network. ARL supplied all hardware and software needed to operate the IDREN portion of the Long Haul Network. Lockheed Martin supplied systems engineering support associated with the design of the IDREN. Also, Lockheed Martin acted as the single point of contact for all Long Haul Network maintenance problems.

The IDREN is an on-demand network facility. Once ARL had established connectivity to the AE3 distributed sites there was no requirement for advanced scheduling or coordination. Therefore, ARL did not have to arrange for IDREN connectivity.

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3.3.9.3 Defense Simulation Internet (DSI)

Not all distributed sites participating in the AE3 Long Haul exercise had a direct connection into the IDREN. For those sites not directly connected to the IDREN, a DSI link was established to the closest IDREN repeater in the USA. This made it necessary for Lockheed Martin to schedule usage of the DSI during the integration period leading up the AE3 as well during the time period of the AE3 itself. Lockheed Martin arranged, through Houston Associates (1-800-259-9660), for DSI connectivity per the following schedule:

For the period 1 August 1996 through 4 October 1996 connections were required from the following distributed sites:

| Location | Site Name |
|------------------------------|------------------|
| ARL Aberdeen, MD | ARL |
| DBBL Fort Benning, GA | DWBL |
| DSABL Fort Sill, OK | FAS |
| Project SIMITAR Bozeman, MT | 163IN |
| RTOS Fort Bliss, TX | ADAS |
| Texas Instruments Dallas, TX | TI |

For the period 9 October 1996 through 16 October 1996 connections were required from the following distributed sites:

| Location | Site Name |
|-----------------------------|------------------|
| ARL Aberdeen, MD | ARL |
| DSABL Fort Sill, OK | FAS |
| Project SIMITAR Bozeman, MT | 163IN |
| RTOS Fort Bliss, TX | ADAS |

3.3.9.4 T1 Network Lines

For those sites that had neither DSI or IDREN connections, dedicated T1 network lines had to be purchased and installed to support long haul data communications. Each site was outfitted with T1 connectivity with the exception of the connection into the AUSA exhibit at the Sheraton. For that connection, three T1 lines were installed to provide redundancy and minimize the possibility of losing the live network feed. A summary of T1 information is shown in Table 3.3.9.4-1.

Date: 17 January, 1997

| Connection Type | Start Date | End Date | Location | Carrier | Carrier POCs | Site POCs |
|-----------------|------------|----------|-------------------------------------|---|---|---|
| T1 | 8/12/96 | 10/31/96 | Streamlined Acquisitions to FIXWest | Pacific Bell 24 hour line: 1-800-332-1321 | Shelly Woodhouse 1-408-369-3317 Sharon Miller 1-408-369-3003 | Don Cahalan 1-408-289-2744 Lance Topman 1-415-604-3664 Bill Jones 1-415-604-6482 |
| T1 | 8/28/96 | 10/15/96 | LMC to ARL | AT&T 24 hour line: 826-7982 | Herb Rhodes 1-407-306-7257 Ron Brewer 1-303-430-2156 | Herb Rhodes 1-407-306-7257 Tom Kile 1-410-278-6808 |
| T1 | 10/10 | 10/31/96 | ARL to AE3 | AT&T 24 hour line: 826-7982 | Ron Brewer 1-303-430-2156 | Tom Kile 1-410-278-6808 Mike Looney 1-202-328-5600 |

Table 3.3.9.4-1 T1 Network Lines Points of Contact

3.3.9.5 OSF Testing

The Operational Support Facility (OSF) integration test was a month long test during which the AE3 participants connected to the OSF at Lockheed Martin in Orlando. Connectivity dates that were supported are detailed in paragraphs 3.3.9.1 through 3.3.9.4.

3.3.9.6 AE3 Demonstration

The AE3 demonstration required connectivity for an integration period plus connectivity for the actual AE3 demonstration. AE3 participants connected to the Sheraton in Washington DC. Connectivity dates that were supported are detailed in paragraphs 3.3.9.1 through 3.3.9.4

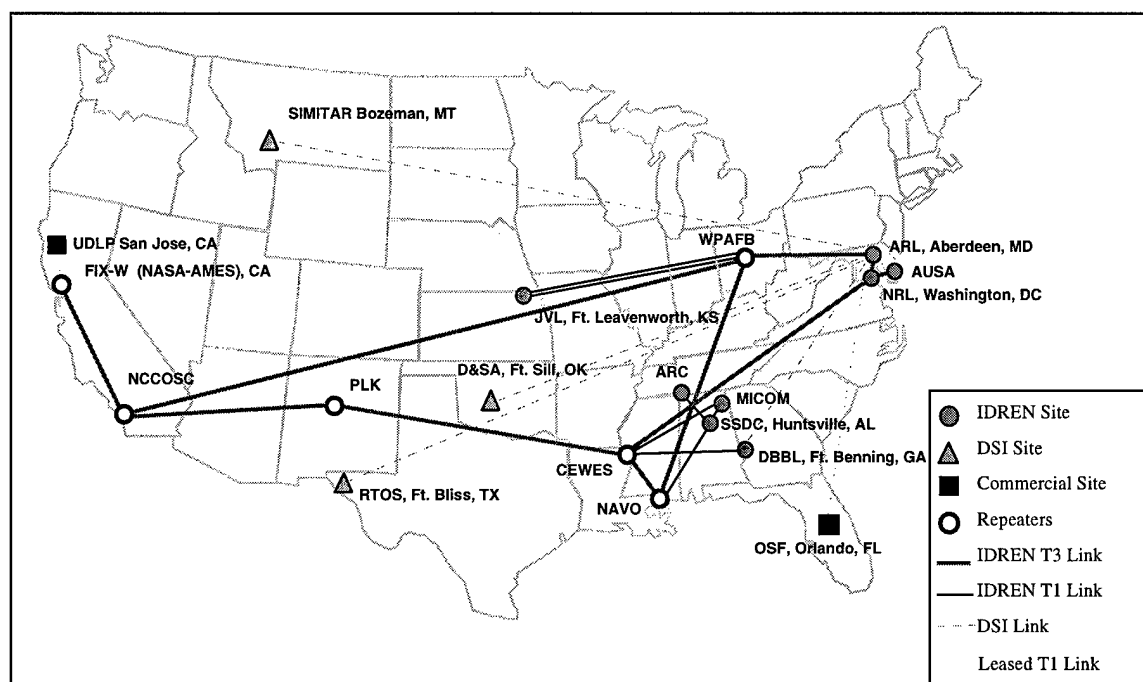
3.4 INTEGRATION AND TEST

Lockheed Martin prepared and executed a phased approach to the integration and testing. The AE3 integration and test process exercised various simulation elements in a building block fashion (refer to Appendix G). Testing began with a Long Haul Network test, followed by subsystem test, then integrated system tests, and finally a full system dry run. To support this phased approach the following test events and locations were scheduled:

Date: 17 January, 1997

- Long Haul Network Test - Aberdeen, Maryland, 8/5 - 8/26
- Operational Support Facility (OSF) Test - Orlando, Florida, 8/26 - 10/4
 - OSF Preparation, 8/26 - 8/30
 - OSF Point-to-Point Test, 9/3 - 9/13
 - OSF Scenario Test, 9/17 - 10/4
- Integration and Execution - AE3, Washington DC, 10/9 - 10/16

Figure 3.4-1 illustrates the communication nodes established to support the integration and test hosted in Orlando, FL and at the AUSA show site - Sheraton Washington.



Note: DBBL DSI Link is a backup, IDREN T1 Installation in Aug '96
 OSF Connection to ARL is for testing in September '96
 JVL to WPAFB is dual T1
 NRL to AUSA line is 10mb commercial line

Figure 3.4-1 AE3 Integration

Table 3.4-1 lists Immersive theater participants and gives the data regarding their interface to the theater and the FP TOC.

Date: 17 January, 1997

| Immersive Theater Participant | Location | Distributed | Live VTC Video | Onsite Video Feed | DIS PDU Theater | DIS PDU FP TOC |
|--------------------------------------|------------------------|--------------------|-----------------------|--------------------------|------------------------|-----------------------|
| NV&ESD | Fort Belvoir, Virginia | N | N | N | Y | N |
| ARC | Huntsville, AL | Y | N | N | Y | Y |
| D&SA | Fort Sill, Oklahoma | Y | N | N | Y | Y |
| DBBL | Fort Benning, GA | Y | Y | N | Y | N |
| ARL | Aberdeen, MD | N | N | N | Y | N |
| JVL | Fort Leavenworth, KS | Y | Y | N | Y | Y |
| Streamlined Acquisition | San Jose, California | Y | Y | N | Y | N |
| Project Simitar | Bozeman, Montana | Y | Y | N | Y | N |
| RTOS | Fort Bliss, Texas | Y | Y | N | Y | Y |
| UAV | Draper Labs, MA | N | N | N | Y | N |
| Battle Planning & Visualization | Fort Leavenworth, KS | Y | Y | Y | N | N |

Table 3.4-1 Interactive Theater Participants**3.4.1 Long Haul Network Test, 5 Aug - 26 Aug**

This test was designed to provide verification of the performance and multicast routing integrity of the AE3 Long Haul Network, which was comprised of Interim Defense Research Engineering Network (IDREN), Defense Simulation Internet (DSI) and commercial T1 and other components. Specific sub-tests are listed in the following section.

3.4.1.1 Reachability

This test verified that the distributed Local Area Networks (LANs) could be contacted by the Long Haul Network, allowing the potential issues to network integration to be identified. The interrogation was accomplished by using UNIX command - ping.

3.4.1.2 M-Bone (Multicast Backbone)

The M-Bone audio and video functionality of the IDREN was tested. Testing verified M-Bone subsystem interface and audio/video quality. This test verified that the AE3 unique multicast addressing scheme allowed the required communications between distributed sites. There were three multicast groups; Immersive Theater, FP TOC Theater, and network/test control (audio teleconferencing). More information on the M-Bone can be acquired through URL.

<http://www.arl.mil/ARL-Directorates/ASHPC/HPCD/MBONE/index.html>.

3.4.1.3 Long Haul Network Test Participants

Table 3.4.1.3-1 lists the Long Haul Network test participant sites, their geographic locations and the type of network to which they interfaced.

| Participant | Location | Network Interface |
|----------------------------|-----------------------------|------------------------------|
| ARC | Huntsville, Alabama | IDREN |
| D&SA | Fort Sill, Oklahoma | DSI |
| DBBL | Fort Benning, Georgia | IDREN |
| ARL | Aberdeen, Maryland | IDREN, DSI, Commercial T1 |
| JVL | Fort Leavenworth, Kansas | IDREN |
| Streamlined Acquisition | San Jose, California | Commercial T1 |
| Project SIMITAR | Bozeman , Montana | DSI |
| RTOS | Fort Bliss, Texas | DSI |
| OSF | Orlando, Florida | Commercial T1 |

Table 3.4.1.3-1 Long Haul Network Test Participants

All of the initial tests were directed by ARL and supported by the technical points of contact from each participating site as shown in Table 3.4.1.3-2.

Date: 17 January, 1997

| Participant | Point of Contact | Phone |
|-------------------------|-------------------------------|------------------------------|
| ARC | Dai Chu Will Kistler | 205-955-5405 |
| D&SA | Bob Bryant | 405-442-3616 |
| DBBL | Jim Morris | 706-682-4300 706-682-5300 |
| ARL | Ginny To | 410-278-3412 |
| JVL | John Ratzenberger Gene Pal | 913-684-9235 913-684-7570 |
| Streamlined Acquisition | Bob Hatton | 407-380-5500 |
| Project SIMITAR | John Wasson SGT. Dan Rose | 208-334-9603 406-444-6969 |
| RTOS | Gil Zuniga | 915-568-1238 |
| Lockheed Martin | Bob Edwards | 407-306-4453 |

Table 3.4.1.3-2 Technical Points of Contact for the Long Haul Network Test**3.4.1.4 Long Haul Network Test Schedule**

Designated personnel were made available at each Long Haul site for on-call support between the hours of 1000 - 1800 EDT between the dates of 8/5 to 8/26. Once the reachability to each site was verified, the machines that had been reached during the test remained up and communicating for the duration of test and through the AUSA show.

3.4.1.5 Army Research Laboratory (ARL)

ARL played the primary role in the Long Haul test and was responsible for the following:

- Providing mouted software to all experiment participants. Software made available via FTP server as described in Section 3.4.1.6.
- Consulting on installation and operation of mouted software if needed.
- Coordination, installation and test of IDREN network assets.
 - Direction of Reachability tests
 - Direction of M-Bone tests
 - Setting up multicast groups and M-Bone tunnels
 - Determining and implementing router filtering
 - DSI - IDREN packet forwarding
 - Direction of Bandwidth/Latency tests
- Generation of a periodic e-mail Test Results Report and forwarding to all AE3 participants

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3.4.1.6 *Mrouted Software*

Mrouted software was required for all distributed participants involved in the live simulation exercise. Mrouted is software that runs on a workstation that implements multicast routing. AE3 used multicast routing to pass data packets on the IDREN. Multicasting lowers bandwidth requirements by directing network traffic to only the appropriate locations. The mrouted software was available via an FTP server.

3.4.1.7 *Distributed Sites*

Each distributed site was responsible for the following:

- Acquiring, downloading and installing mrouted software on their designated mrouted machines (SGI Indy).
- As soon as possible, sending e-mail to "ae3coms@arl.mil" providing the IP address of the mrouted machine and the addresses of the simulation machines.
- During the individual site test, the designated personnel had to be available via phone until the M-Bone tunnel was up. The individual did not necessarily need to be at the simulation site if they had remote access.
- Coordination of required personnel, equipment and services at the distributed sites was a site responsibility.

3.4.1.8 *Equipment*

Each participating site required an SGI Indy running IRIX 5.3 for the test and duration of the experiment to run the mrouted software which was used to support multicasting. For those sites that could not obtain an Indy, loaners were supplied for the duration of the experiment.

3.4.1.9 *Lockheed Martin*

Lockheed Martin was responsible for the following:

- Scheduling the DSI connectivity and the commercial data line connectivity required for this test.
- Providing administrative and technical support to ARL as required for the conduct of the test.

3.4.2 OSF Integration and Test, 26 Aug - 4 Oct

OSF Test in Orlando provided functional and interface testing of Immersive Theater subsystems. This test also verified interconnected functionality of all AE3 sites. Initially, each component was tested individually. The test culminated in a full system test to verify the functional performance of the entire Immersive Theater. This test was broken into three phases:

- Phase 1: OSF Preparation, 8/26 - 8/30 (Section 3.4.2.1)
- Phase 2: Point-to-Point Test, 9/3 - 9/13 (Section 3.4.2.2)
- Phase 3: Scenario Test, 9/17 - 10/4 (Section 3.4.2.3)

All tests were scheduled at Lockheed Martin for Monday through Friday, 0900 - 1800 hours EDT. The weekends were reserved as make-up time but were not worked.

3.4.2.1 OSF Preparation 26 Aug - 30 Aug

The Operational Support Facility (OSF) at Lockheed Martin ADST II facility was the site for interim integration and testing. During this period Lockheed Martin performed the tasks required to prepare the facility for AE3 exercise integration and test. These tasks were: Assure that the facility established communication to the IDREN; Allocate appropriate space in the OSF; Install theater components (Local Area Network (LAN) lines, workstations, audio-visual equipment). The following paragraphs give details of the OSF preparation activities.

3.4.2.1.1 OSF Long Haul Network Communication Test

Initially the Lockheed Martin facility did not communicate to the DSI or IDREN networks. LMC installed a commercial T1 line from the Orlando OSF to ARL in Aberdeen, Maryland to provide connection into the IDREN and performed tests to verify connectivity.

3.4.2.1.2 Theater Components Test

The objective of this test was to verify interfaces between and operation of the theater subsystems.

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The key subsystems of the Immersive Theater were installed at the OSF to provide a test bed for testing theater functional capability and to support long-haul testing. Both the integration of Long Haul Network participants and Long Haul Network functional test were coordinated from Lockheed Martin's OSF. The subsystems tested included: IG's; Soundstorm, Data logger; Clear Comm; SAFOR's; Audio/Visual System (including projection screen, projectors, edit station, and video switcher system)

Figure 3.4.2.1.2-1 shows the OSF LAN configuration (functionally identical to the AUSA LAN) relevant to the test. (The numbers next to each box represent the unique network address (IP address) of that machine on the distributed network.)

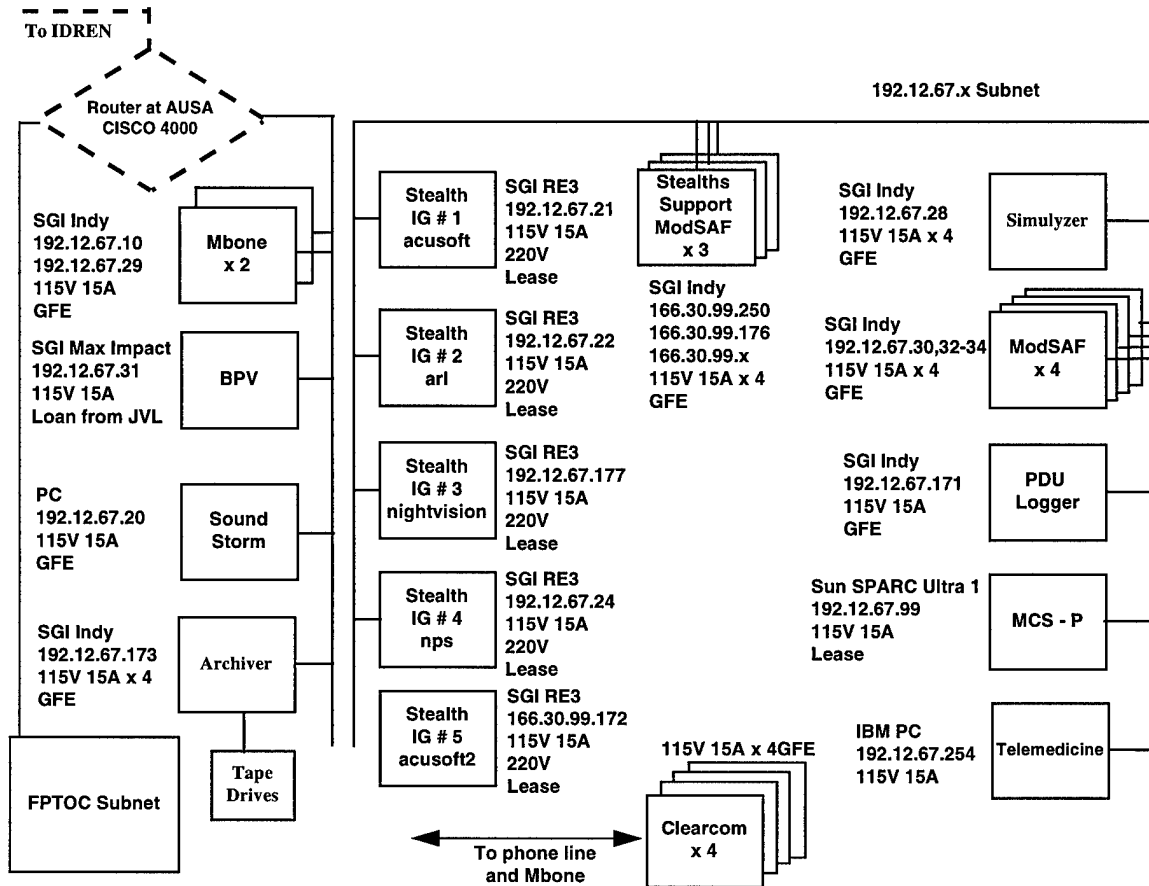


Figure 3.4.2.1.2-1 OSF/AUSA LAN Topology.

3.4.2.1.3 OSF Preparation Participants

Table 3.4.2.1.3-1 lists OSF preparation participants.

| Participant | Location | Test Function | Test Schedule |
|----------------|--------------------|--|---------------|
| ARL | Aberdeen, Maryland | Test T1 connection to OSF | 8/26 - 8/30 |
| LM (OSF) | Orlando, Florida | Test T1 connection to ARL , install and test LAN | 8/26 - 8/30 |
| AcuSoft | Orlando, Florida | Install and Test IG #1 | 8/26 - 8/30 |
| SGI | Orlando, Florida | Install and Test IG #1 | 8/26 - 8/30 |
| JVL | Orlando, Florida | Early data capture | 8/26 - 8/30 |
| Maguire Reeder | Orlando, Florida | Early data capture | 8/26 - 8/30 |

Table 3.4.2.1.3-1 OSF Preparation Participants

3.4.2.2 OSF Point-to-Point Test, 3 Sept - 9 Sept

OSF point-to-point Test verified the operational functionality of the theater subsystem and the interface to each distributed site. The goal of the point-to-point phase was to identify and correct all software / hardware problems before Scenario Test at OSF. At the end of OSF point-to-point test the theater subsystems were functionally tested and integrated. Further, all distributed participants were interoperating correctly. This resulted in a system ready for full scenario dry-run and rehearsal.

As part of the point-to-point testing the following system tests were performed for each distributed site:

- Connectivity between the OSF and the distributed site.
- Correctness and interoperability of the visual data bases as loaded on their respective machines at the distributed sites were verified via a correlation test.
- Model uniformity was tested via inspection of enumeration tables, and representative sampling of distributed entities.
- The AE3 scenario was run to test long-haul effects of the exercise.

A key part of this test phase is the collection of data. Logger files were collected and made available to AE3 participants. These files are used all AE3 participants for debugging purposes.

To facilitate the distribution of logged files, databases, and public DIS test tools, Lockheed Martin establish an FTP account accessible via the Internet where any party wishing to retrieve information was able to do so by logging onto the system through the Internet.

The terrain data bases that were used for testing was Chorwon Korea and Fort Benning McKenna MOUT. Lockheed Martin prepared a standardized version of the Chorwon database in multiple database source data

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formats and placed it on the FTP site for distribution to all participants. The Naval Post Graduate School (NPS) prepared the MOUT database.

3.4.2.2.1 OSF Point-to-Point Test Participants

Table 3.4.2.2.1-1 lists all of the point-to-point test participants, their location and test times.

| Participant | Location | Network Interface | Test Schedule |
|-------------------------|--------------------------|-------------------|---------------|
| ARC | Huntsville, Alabama | IDREN | 9/3 - 9/13 |
| D&SA | Fort Sill, Ohio | DSI | 9/3 - 9/13 |
| DBBL | Fort Benning, Georgia | IDREN | 9/3 - 9/13 |
| ARL | Aberdeen, Maryland | IDREN, DSI | 9/3 - 9/13 |
| JVL | Fort Leavenworth, Kansas | IDREN | 9/3 - 9/13 |
| Streamlined Acquisition | San Jose, California | Commercial link | 9/3 - 9/13 |
| Project SIMITAR | Bozeman , Montana | DSI | 9/3 - 9/13 |
| RTOS | Fort Bliss, Texas | DSI | 9/3 - 9/13 |
| OSF | Orlando, Florida | Commercial Link | 9/3 - 9/13 |

Table 3.4.2.2.1-1 OSF Point-to-Point Test Participants.

3.4.2.3 OSF Scenario Test, 17 Sept - 4 Oct

The Scenario Test was performed at the OSF in Orlando, Florida. The AE3 experiment scenario was exercised, for the first time, on a distributed simulation network using the IDREN / DSI / Commercial Data Lines environment. The scenario laydown was aggressive in terms of number of entities and complexity. However, the building block test approach used in earlier phases mitigated the risk associated with first-time implementation.

This test combined all sites over a three week period. Each morning was reserved for problem resolution and test setup (0800 - 1200 EDT). A live networked test was scheduled each test day (1300 - 1700 EDT). The first two weeks were devoted to integration test and scenario tuning and the third week was devoted to formal scenario dry run. Figure 3.4.2.3-1 shows the network configuration relevant to the test.



This test identified the limits of system and network performance. PDU traffic was gradually increased to a level that was considered greater than "worst case" for the AUSA scenario to determine if this was possible without experiencing anomalies.

ISDN connections were made between the integration site at the OSF and each of the distributed video feed sources to test the Live Feed Video. Testing verified ISDN / Switch subsystem interface, VTC system bandwidth (update rate) and image quality.

Scenarios were repeatedly run and refined. Each trial was logged for playback over the network in case an anomaly needed to be debugged. The actual AE3 emcees rehearsed their voice script live during the trial runs. Formal trial runs were conducted during the final two days of rehearsal (Oct 2-4) which included supporting demonstrations for Army VIP's escorted by STRICOM.

Table 3.4.2.3.4-1 lists all of the long-haul participants, their location and specifies the type of the network to which they interfaced.

Date: 17 January, 1997

| Participant | Location | Network Interface | Schedule |
|-------------------------|--------------------------|-------------------|-------------|
| ARC | Huntsville, Alabama | IDREN | 9/17 - 10/4 |
| D&SA | Fort Sill, Ohio | DSI | 9/17 - 10/4 |
| DBBL | Fort Benning, Georgia | IDREN | 9/17 - 10/4 |
| ARL | Aberdeen, Maryland | IDREN, DSI | 9/17 - 10/4 |
| JVL | Fort Leavenworth, Kansas | IDREN | 9/17 - 10/4 |
| Streamlined Acquisition | San Jose, California | Commercial link | 9/17 - 10/4 |
| Project SIMITAR | Bozeman , Montana | DSI | 9/17 - 10/4 |
| RTOS | Fort Bliss, Texas | DSI | 9/17 - 10/4 |

Table 3.4.2.3.4-1 Scenario Test Participants.**3.4.3 AUSA Integration and Execution, 10/9-10/16****3.4.3.1 Move-in**

The items used in the System Test were disassembled, packed, and transported to the Sheraton's Cotillion room for the AE3 demonstration. Due to a short set up time (5 days) the coordination of the move-in to the Sheraton had to be precisely executed. A detailed move-in schedule was coordinated months in advance and appears in appendix F. It was critical to assure that trucks arrived in the correct order to support the move-in activities in the correct sequence. For this reason a detailed shipping plan was coordinated in advance and is detailed in section 3.6 of this report.

3.4.3.2 Integration

The integration process focused on establishing a reliable demonstration capability which could be installed and up and running in a few days. Priorities had to be established for integration activities. First priority was establishing and testing connectivity for the Long Haul network linkage from ARL to the Sheraton Cotillion Ballroom. Second priority was integration and scenario test of the interactive theater components. Stand alone participants received lowest priority and were installed and tested as time permitted. A detailed AUSA Integration plan was coordinated months in advance and appears in appendix G.

3.4.3.3 AE3 Operation

The AE3 exhibit reception desk was manned by LAM Task Force personnel who provided the schedule of live show times, distributed tickets to the Live Theaters and handled VIP scheduling. Standalone exhibits were manned by the exhibitors with support from STRICOM and LAM Task Force personnel who provided subject matter expertise and helped to answer general exhibit questions and debrief personnel coming out of the live theaters. The schedule of virtual theater show times appears in Table 3.4.3.3-1:

Date: 17 January, 1997

Monday 14 October Schedule

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 1100 | 1105 | 1125 | 1130 | 1150 |
| 1130 | 1135 | 1155 | 1200 | 1220 |
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| 1500 | 1505 | 1525 | 1530 | 1550 |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| BREAK | | | | |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | 1900 | 1920 |
| 1900 | 1905 | 1925 | 1930 | 1950 |

Table 3.4.3.3-1 Virtual Theater Show Schedules - 1 of 3

Tuesday 15 October Schedule

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 0900 | 0905 | 0925 | 0930 | 0950 |
| 0930 | 0935 | 0955 | 1000 | 1020 |
| 1000 | 1005 | 1025 | 1030 | 1050 |
| 1030 | 1035 | 1055 | 1100 | 1120 |
| BREAK | | | | |
| 1130 | 1135 | 1155 | 1200 | 1220 |
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| 1500 | 1505 | 1525 | 1530 | 1550 |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| BREAK | | | | |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | 1900 | 1920 |
| 1900 | 1905 | 1925 | 1930 | 1950 |

Table 3.4.3.3-1 Virtual Theater Show Schedules - 2 of 3

Date: 17 January, 1997

Wednesday 16 October Schedule

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 0900 | 0905 | 0925 | 0930 | 0950 |
| 0930 | 0935 | 0955 | 1000 | 1020 |
| 1000 | 1005 | 1025 | 1030 | 1050 |
| 1030 | 1035 | 1055 | 1100 | 1120 |
| BREAK | | | | |
| 1130 | 1135 | 1155 | 1200 | 1220 |
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| BREAK | | | | |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| 1600 | 1605 | 1625 | 1630 | 1650 |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | | |

Table 3.4.3.3-1 Virtual Theater Show Schedules - 3 of 3

3.4.3.4 Move-out

The AE3 exhibit was disassembled, packed, and transported to Orlando and Colorado Springs. Due to a short tear down time (2 days) the coordination of the move-out to the Sheraton had to be precisely executed. The move out activities appear in the detailed move-in schedule that appears in appendix F.

3.5 IMMERSIVE THEATER

The Immersive Theater displayed a combination of live networked participants and pre-recorded presentations in the ballroom at the AUSA. The Immersive Theater was an enclosed room constructed within the ballroom.

3.5.1 Immersive Theater Fabrication

Lockheed Martin provided the following equipment and services to support the development, installation, and integration of the Immersive Theater.

FACILITY REQUIREMENTS (inside the ballroom)

(1) Dial Out Phone in the front of the theater (integration use only)

Folding Tables

(12) 20 amp power circuits

(1) 5 Ton AC Unit

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FACILITY REQUIREMENTS (inside the techroom)

- (4) Dial Out Phone in the front of the theater
- Folding Tables
- (8) 20 amp power circuits
- (4) 30 amp 3 phase power circuits
- (1) 5 Ton AC Unit

SOURCES

- (4) 3 Channel SGI ONYX Image Generators. (These systems were used to provide the virtual view of the entities and databases in the AE3 exercises)

NPSNET (MCO)

LAMTF (MCO)

ARL (MCO)

NVESD (MCO)

DISPLAY HARDWARE

- (1) 10' x 30' Rear Projection screen
- (3) Barco 8100 LCD Light Cannon Projectors (*projected (3) 6'7" x 8'9" images / upper screen*)
- (3) Sony VPH-1272 Graphic Projectors (*projected (3) 2'10" x 3'9" images / lower screen*)

CONTROL & SOURCE HARDWARE

- (1) 32 x 8 RGBs Matrix Switcher
- (2) SHOWDirect Control Systems
- (6) Betacam SP Players (Video Backup)
- (6) Betacam SP Recorders (Show Record)
- (2) CRV Laser Disc Rec./Players (GoTo)
- (14) Multi-Resolution Scan Converters
- (14) Analog RGBs Interface Kits
- (8) Signal Transcoders
- (30) Source Monitors (LCD)

LIGHTING HARDWARE

- (8) 1K Lekos
- (2) 1K Scoops
- (3) 1K DP's
- (1) Schedule 40 Light Pole (Flown)
- Control Console
- Dimming
- Cables & Distribution

PRODUCTION HARDWARE

- (1) Sony Betacam SP Shooters Package
- (1) Folsom Hi-Res Video Scan Converter
- (20) Betacam SP VideoTapes

STAGING HARDWARE

- (1) Custom Screen Divider / Support
- (3) Scaffold Projection Towers
- (1) Custom Control Console

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VIDEO SOURCES

| Feed | Qty. | Format |
|---------------------|-------------|---------------|
| Stealth #1 (LAMTF) | 3 Channel | Hi-Res |
| Stealth #2 (NPSNET) | 3 Channel | Hi-Res |
| Stealth #3 (ARL) | 3 Channel | Hi-Res |
| Stealth #4 (NVESD) | 3 Channel | Hi-Res |
| BPV | 1 Channel | Hi-Res |
| ASAS | Deleted | N/A |
| UAV | Deleted | N/A |
| MCS-P | 1 Channel | Hi-Res |
| ModSAF | 1 Channel | Hi-Res (SGI) |
| C3I (Fort Benning) | 1 Channel | Hi-Res (SGI) |
| Live Feed (VTC) | 4 Channel | NTSC |
| Recorded Video | 9 Channel | NTSC |

VIDEO TELECONFERENCING

| SITES | SYSTEMS |
|----------------------------|--|
| AMC-UD - San Jose, CA | 1 - PicTel System - Image Technical Services (ITS) |
| DBBL - Fort Benning, GA | 1 - PicTel System (ITS) |
| SIMITAR - Bozeman, MT | 1 - PicTel System (ITS) |
| RTOS - Fort Bliss, TX | 1 - PicTel System (ITS) |
| JVL - Fort Leavenworth, KS | 1 - PicTel System (ITS) |
| Sheraton - Wash., D.C. | 5 - PicTel Systems (ITS) |
| Sheraton - Wash., D.C. | 1 - CCD Theater Camera |

AUDIO HARDWARE

(1) Soundstorm System
 (1) Clear Com 8 Station 2 Ch. Com System
 (1) Wireless IFB (MC)
 (1) 32 x 8 Audio Console
 (2) Main Speaker Enclosures
 (2) Rear Speaker Enclosures
 (2) Sub Woofer Enclosures
 Amps & Processing
 Cables & Distribution

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AUDIO SOURCES

| Feeds | Quantity |
|-----------------|------------|
| Soundstorm #1 | 4 Channels |
| Live Feed (VTC) | 5 Channels |
| Recorded Audio | 4 Channels |
| .WAV File | 2 Channels |
| Microphones | 5 Channels |

Figure 3.5.1-1 details the Immersive Theater video system wiring and routing.

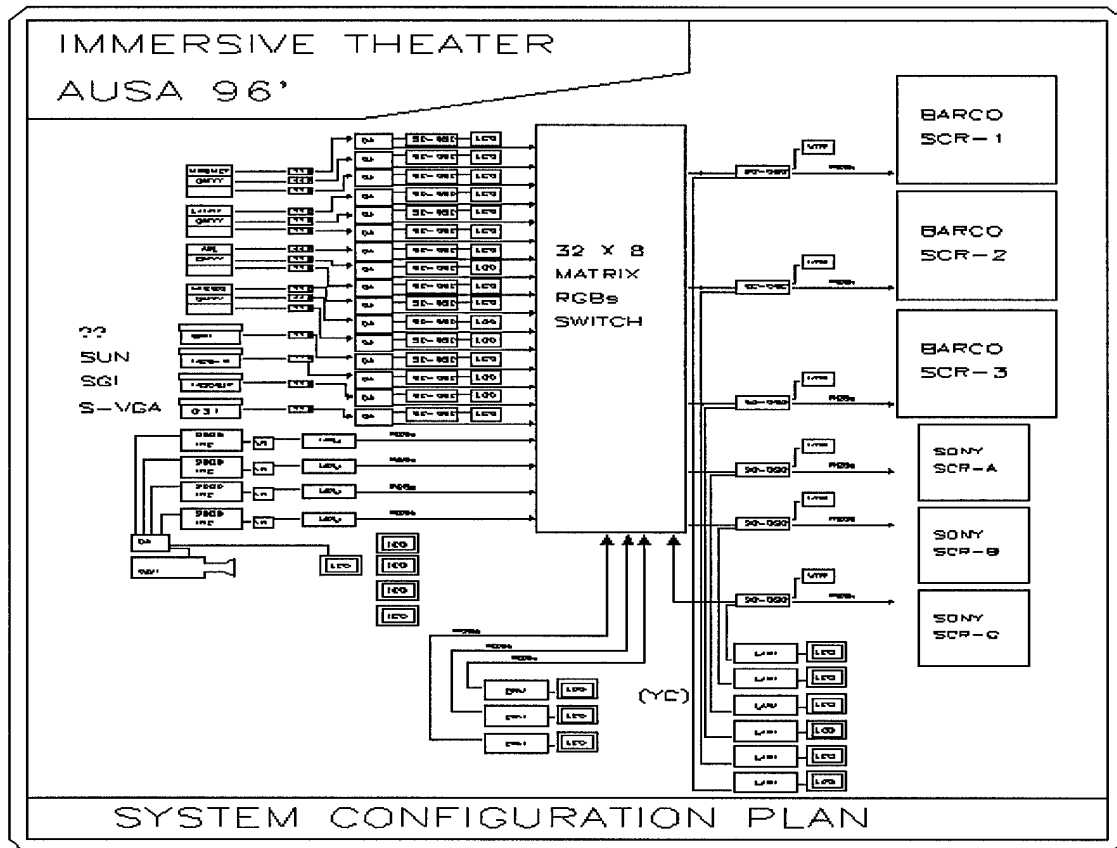


Figure 3.5.1-1 Immersive Theater Video System Wiring

3.5.2 Immersive Theater Presentation Management

This section discusses both Lockheed Martin and Image Technical Services AE3 organizations utilized in the Presentation for the Pre-Interim Site, Interim Site, and Demonstration. The Presentation Management consisted of different disciplines. The Test Director was responsible for making the audible instructions for executing the demonstration. In coordination with the test director was a Master of Ceremonies verbally presenting the immersive theater contents. There was a combination of five technicians and engineers that were placed in an operational role in the front of the audience of the immersive theater. The function of this

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presentation personnel was to interact with the test directors queues. There was a rotation used to allow fresh operators to execute the demonstration.

There were several technicians and engineers supporting the operations of the behind the scenes of the immersive theater. The charter of this support included but was not limited to: network maintenance; ModSAF operation; workstation - BPV, Stealth, ASAS, MCS/P, datalogger, sound storm, M-Bone.

The Lockheed-Martin personnel supporting the pre-interim, interim site, and demonstration were as follows.

Pre-Interim Site

- (1) Program Manager
- (1) Program Engineer
- (1) Lead Technician
- (1) Technician
- (1) Visual Engineer
- (3) Engineers

Interim Site

- (1) Program Manager
- (1) Program Engineer
- (1) Lead Technician
- (1) Technician
- (1) Visual Engineer
- (3) Engineers

Demonstration

- (1) Program Manager
- (1) Program Engineer
- (1) Lead Technician
- (1) Technician
- (1) Visual Engineer
- (5) Engineers

The personnel required from IMAGE Technical Services to support the Immersive Theater Pre-Interim Site, Interim Site, and Demonstration were as follows.

Pre-Interim Site

- (1) Videographer (Video Acquisition)
- (1) System Engineer (Remote VTC Integration)
- (2) System Engineers (Design)

Interim Site

- (4) System Engineers
- (1) Show Director

Demonstration

- (4) System Engineers
- (1) Show Director
- (1) Camera Operator

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3.6 TRANSPORTATION

LMC was responsible for the overall coordination, pick-up, staging, and delivery of the demonstration materials to the Sheraton Washington site and return to designated destinations. Wares Van and Storage Company provided coordination of the vehicles transporting the materials. Each Standalone exhibitor appointed a specific representative to work with LMC to ensure their compliance with published shipping schedules. The following Figures (3.6-1, 3.6-2) depict the "Inbound shipping" and the "Outbound Shipping" respectively and of the demonstration.

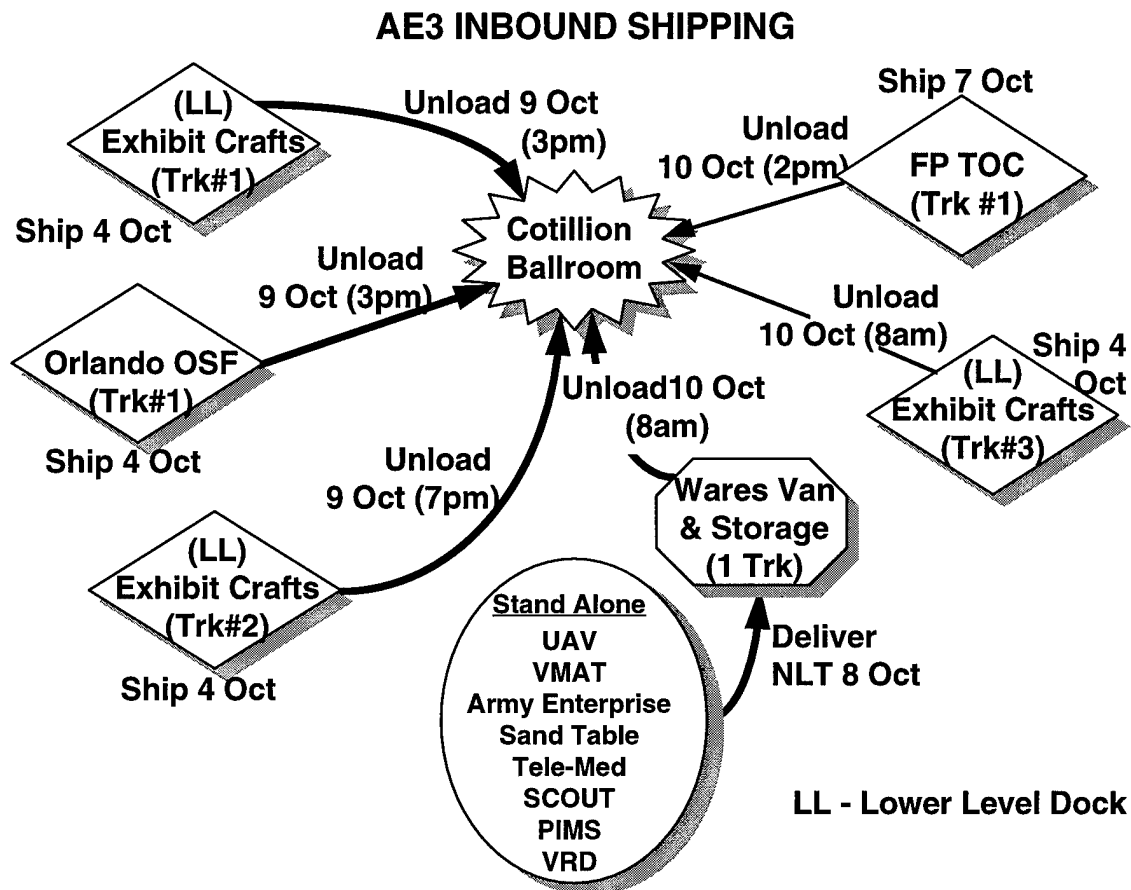


Figure 3.6-1 Inbound Shipping

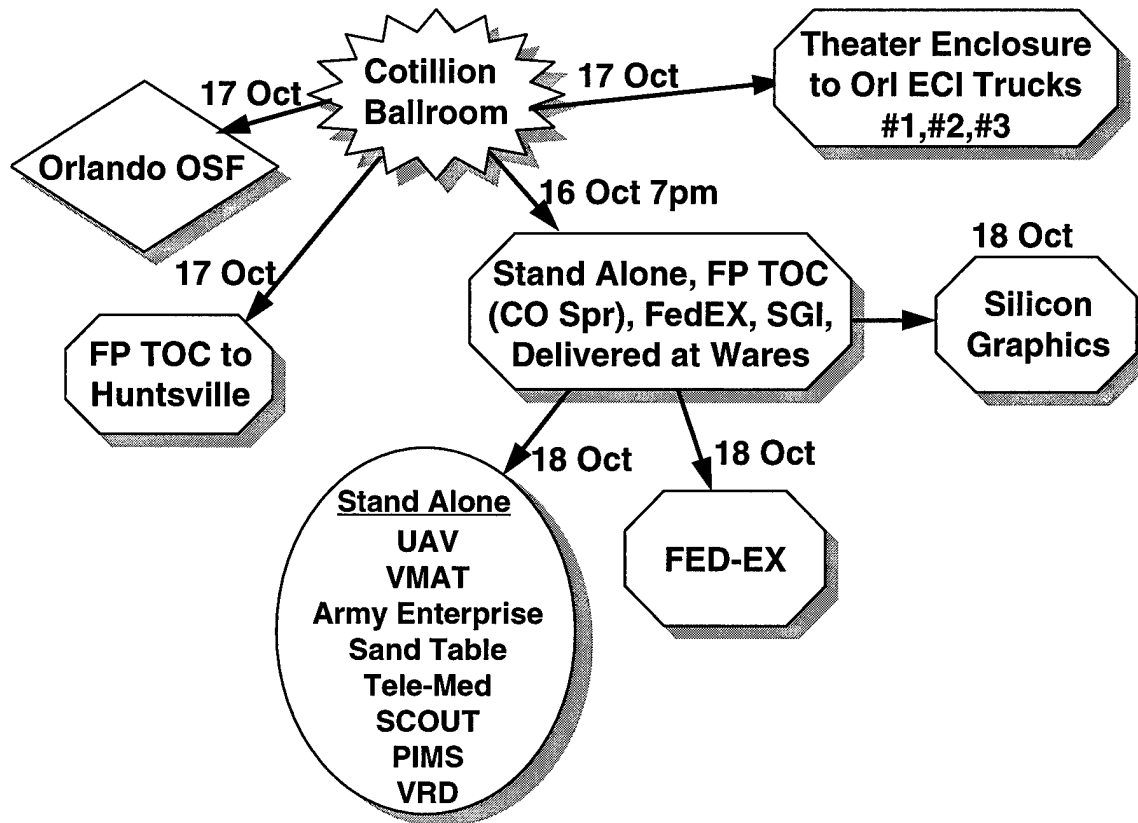
The following table (Table 3.6-1) depicts the actual shipping schedule arriving and leaving at the Sheraton Cotillion Ballroom.

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| Time | INBOUND 9 October | INBOUND 10 October | OUTBOUND 16 October | OUTBOUND 17 October |
|-------------|------------------------------|-------------------------------|--------------------------------|--------------------------------|
| 08:00 | ECI #1 | ECI #4 Stand Alones | | ECI #1 |
| 09:00 | LMC OSF | | | |
| 11:00 | ECI #2 | | | LMC OSF |
| 12:00 | | | | ECI #2 |
| 14:00 | | FP TOC | | FP TOC |
| 15:00 | ECI #3 | | | |
| 16:00 | | | | ECI #3 |
| 18:00 | | | | ECI #4 |
| 19:00 | | | Stand Alones ECI #1 | |
| 20:00 | | | UAV Vans | |

Table 3.6-1 Actual Shipping Schedule

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AE3 OUTBOUND SHIPPING**Figure 3.6-2 Outbound Shipping**

The following were exceptions to this plan: Army Enterprise moved their personal equipment in and moved it out of the Cotillion Ballroom. The UAV group moved specific equipment in and moved all of their equipment out of the Cotillion Ballroom.

The FP TOC theater is currently stored at the FP TOC Colorado Springs facility. The immersive theater is being stored at an Orlando facility.

Exhibit Crafts used four 48' trucks.

3.7 RESIDUAL EQUIPMENT

The Residual Equipment lists all of the equipment that has been purchased for the AUSA Delivery Order. Each item is listed in a spreadsheet consisting of reference tag number, description, model, serial number, acquisition date, and user. This section is comprised of two spreadsheets, one is the running inventory of AUSA purchased assets and the other is the inventory presently at Suddath Inc. storage facilities. APPENDIX B - RESIDUAL EQUIPMENT lists the two spreadsheets of all AUSA owned equipment.

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3.8 RECOMMENDATIONS

This section discusses the recommendations or "lessons learned" of several of the technical and non-technical players involved with the AE3. The following is a list of all the recommendations received after the demonstration was completed.

3.8.1 Implement Contrasting Scenarios for AE4

Observation:

The Army Experiment message may be better illustrated through the use of contrasting scenarios (Good outcome vs Bad outcome). This year the message, "Dominant Real Time Situational Awareness" was presented by running a simulated exercise in the theater and FP TOC. The exercise was constructed in the 21st Century and showed how a well-equipped US Army will perform assuming the Army does a good job leveraging available technology. (Good outcome) The message would be further enhanced by showing the contrast or "what if" should our Army not continue to leverage technology. (Bad outcome)

Discussion:

The problem is that the message has to be clearer to all levels of audience and that the consequences of ignoring the message could be better illustrated. The potential effect is that the message is lost on our audience and the audience may not be completely motivated or convinced.

AUSA should illustrate the seriousness of future battlefield complexity and danger of losing step with technological innovations and advancements which would result in forces at a disadvantage. The message would be further enhanced by showing the contrast or "what if" should our Army not continue to leverage technology. Instead of just showing how good we are today, we should show how quickly that could change, and the grave consequences awaiting. Next years authors of the AE4 message should start today conceptualizing a message which includes contrast.

Recommendation:

Notionally should present two scenarios to the audience. First show a poorly equipped 21st Century Army being out paced by an enemy with better intelligence and situational awareness, spiraling to a ever worsening situation. The second scenario would show an Army with world-leading technology, able to dominate the battlefield and win decisively. Finish with an observation that we can not afford to stand still and that we must remain far-sighted. This recommendation can be applied to any main theme selected for AE4. TRADOC and the Army leadership would improve the effectiveness of the Army Experiment by including some contrast in the AE4 message in '97.

3.8.2 Long Haul Network Integration at the Sheraton Washington

Observation:

The AE3 network line installation was scheduled for the week prior to AUSA '96 and, due to the nature of network installation, there was high risk that the live network feed would not be installed in time to support the live simulation exercise. There are many levels of telecommunications companies. The physical installation and engineering of the network is a multiple step processes. Should any problem happen this

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process could be delayed anywhere from days to weeks. The critical timing of the AUSA show dictated that long haul network lines be installed and tested early rather than just before the show.

Discussion:

The AE4 prime contractor (AE3 was Lockheed Martin) should accelerate AE4 network installation. Further, only one group should be made solely responsible for all network lines and activities to avoid any possible disconnects or confusion.

Recommendation:

Assuming the AE4 is still going to be conducted as a live simulation exercise it would be a good idea to do the following:

Make one organization solely responsible for all long-haul network establishment and connectivity.

Assuming that the Sheraton will continue to be the future host for the AUSA demonstration, permanently upgrade the Sheraton Hotel's internal network lines.

Very Important: Install AE4 network lines 2-4 weeks prior to the show and send a network engineer to the show to install and test the lines with a UNIX workstation.

3.8.3 Visual System Engineering Coordination**Observation:**

There should be a greater coordination between the agency generating the script and the lead for the visual systems. This coordination needs to start early in the program.

Discussion:

A substantial amount of effort was spent reworking portions of the script because the visual systems could not produce the images required. The problem was such that a fifth visual system was identified as required during the Orlando integration phase. The following problems contributed:

The script was very tightly coordinated and the stealth visual system was required to teleport ("jump") from point-to-point frequently and display a picture almost instantaneously. This causes problems in any visual system because the database has to be paged in before a picture can be displayed.

One of the Long Haul SAFOR participants had a database correlation problem which resulted in Helicopters flying at 500 feet in the Theater when the simulation generating the Helicopters thought they were masked behind a hill within 50 feet of the terrain.

Recommendations:

When the Computer Generated Forces (CGF) scenes are generated they need to be viewed with a 3D viewer in a replicated scenario situation before they are blessed as finished.

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3.8.4 Confine The Scenario to Localized Areas

Observation:

Database effort for AE3 was greater than anticipated.

Discussion:

Prior to AE3 simulator integration localized regions were selected in the database for the exercise. The ground entities within the simulation exercise were supposed to confine their movement to remain within the bounds of these areas. Upon actual integration, the SAFOR ground entities in the exercises were not within the agreed regions. The database scenery had been enhanced and enriched only within the agreed regions (a cost saving measure). This resulted in reworking areas of the data bases and an increase in the scope of the database enhancement effort.

Recommendations:

SAFOR operators and visual system engineers need to work closely to assure that the exercise looks good in the finished database and to minimize database modeling effort.

3.8.5 Record a Backup Sound Track

Observation:

Sounds were not recorded on the immersive theater backup video tapes.

Discussion:

Even when the show would run tape, SoundStorm was still required to send audio to the theater. It seems that this could be better handled by including the soundtrack along with the images.

Recommendation:

SoundStorm should be recorded as a track for when they cut to the audio/video system tape.

3.8.6 Enhance SoundStorm

Observation:

The battlefield sounds in the immersive theater did not always play appropriate sounds.

Discussion:

- a.) SoundStorm does not support every sound required in the theater
- b.) SoundStorm did not always play sounds that were "out of earshot" to the view position.

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Recommendation:

a.) The SoundStorm system owned by LAM Task Force should be updated via a software maintenance agreement. Reality by Design offers a maintenance package for a yearly fee. Reality by Design can be reached at: (617)942-0440. Point of Contact: Joanne L. Metzger, President. Additional info at <http://www.rbd.com>.

b.) To play sounds that are out of earshot, yet still required for theatrical realism, SoundStorm sounds should be canned and recorded on the audio/visual tapes.

3.8.7 Wide Area Network Single Point of Contact**Observation:**

At the beginning of integration at AE3, it was determined that the 10 Mbit line connecting NRL and the Cotillion Ballroom was not going to be installed as planned. This could have potentially resulted in not having the distributed sites connected to the show.

Discussion:

Not having an installed 10 Mbit line resulted in having to place an emergency order for two T1 lines to replace it. It was difficult to obtain a two day turn-around on T1 orders that normally take at least a month from the order date to the install date. ARL was responsible for the ordering the 10 Mbit line. They placed the order through MFS who, in turn, were to place an order through Bell Atlantic. Evidently, the order to Bell Atlantic was never made. MFS did correct the situation by pushing an order for two T1 lines through the system faster than normal.

It was also evident, after ARL did a band width analysis and after the show itself, that using a 10 Mbit line was not a necessity. Three T1 lines had plenty of band width. In fact, two T1 lines had enough band width to run the show however, it was reassuring to have the third T1 line as a backup.

Recommendation:

Only one person should be in charge of setting up the wide area network. Coordination between persons at differing organizations can cause confusion.

3.8.8 Network Line Installation Dates**Observation:**

T1 and ISDN lines did take considerable time to install from the time the order had been placed. Facilities issues often pushed the install date back further.

Discussion:

Do not assume that every location has ISDN service. For example, the local carrier in Bozeman, MT did not provide ISDN service. They did however, provide "switched 56" service. This resulted in the PicTel system for that location having to be reconfigured. The T1 lines were not immune to problems either. There were difficulties in bringing the T1 line from Bell South's D-mark into the OSF. In summary, order wide area network lines early using the contact names and numbers listed in the After-Action Report.

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Recommendation:

Lines for the wide area network should be reserved/ordered as far in advance as possible.

3.8.9 T1 Leased Line Testing Considerations**Observation:**

Neglecting to have a configured Communication Servicing Unit/Data Servicing Unit (CSU/DSU) at each location along with the proper cables could cause delays in testing the T1 line.

Discussion:

The carriers that install the T1 lines do not typically lease CSU/DSUs. Therefore, it is important to make sure that there is a CSU/DSU at each end of the T1 line and that it is configured correctly. Also, depending on the type of router, a specific cable is needed to connect the CSU/DSU to the router. Further, the CSU/DSU devices at each end of a given line must be identical meaning not only they are the same manufacturer and model number but, they must be programmed to be compatible.

Recommendation:

When ordering T1 lines, it is important to be sure that the location at each end of the T1 has a properly configured CSU/DSU and the correct cable to connect it to the router.

4. PROGRAM MANAGEMENT**4.1 PROGRAM MANAGEMENT**

The Program Management that LMC performed was in accordance with the STRICOM Statement of Work for LAM TF Task Force Army Experiment III, (LAM TF AE3), Proof of Principle (w/Mini-FAS), 12 March 1996, Rev 2.0. This included program management support for the attendance of In-Process Reviews (IPRs), Scenario Development meetings, Technical Interchange Meetings (TIM's), and other meetings required to support the AE3. LMC analyzed the schedule and determined problem areas ASAP and took corrective actions as required. STRICOM provided responsible personnel at the LMC facility throughout the AE3 program. This function enabled immediate attention to possible out of scope issues.

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4.2 PROGRAM ORGANIZATION

STRICOM's program organization is depicted in Figure 4.2-1 below.

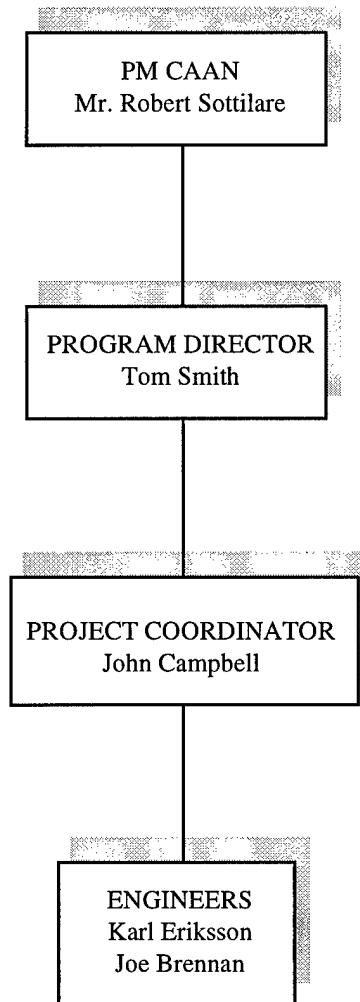


Figure 4.2-1 STRICOM AE3 Organization

LMC's final program organization is depicted in Figure 4.2-2.

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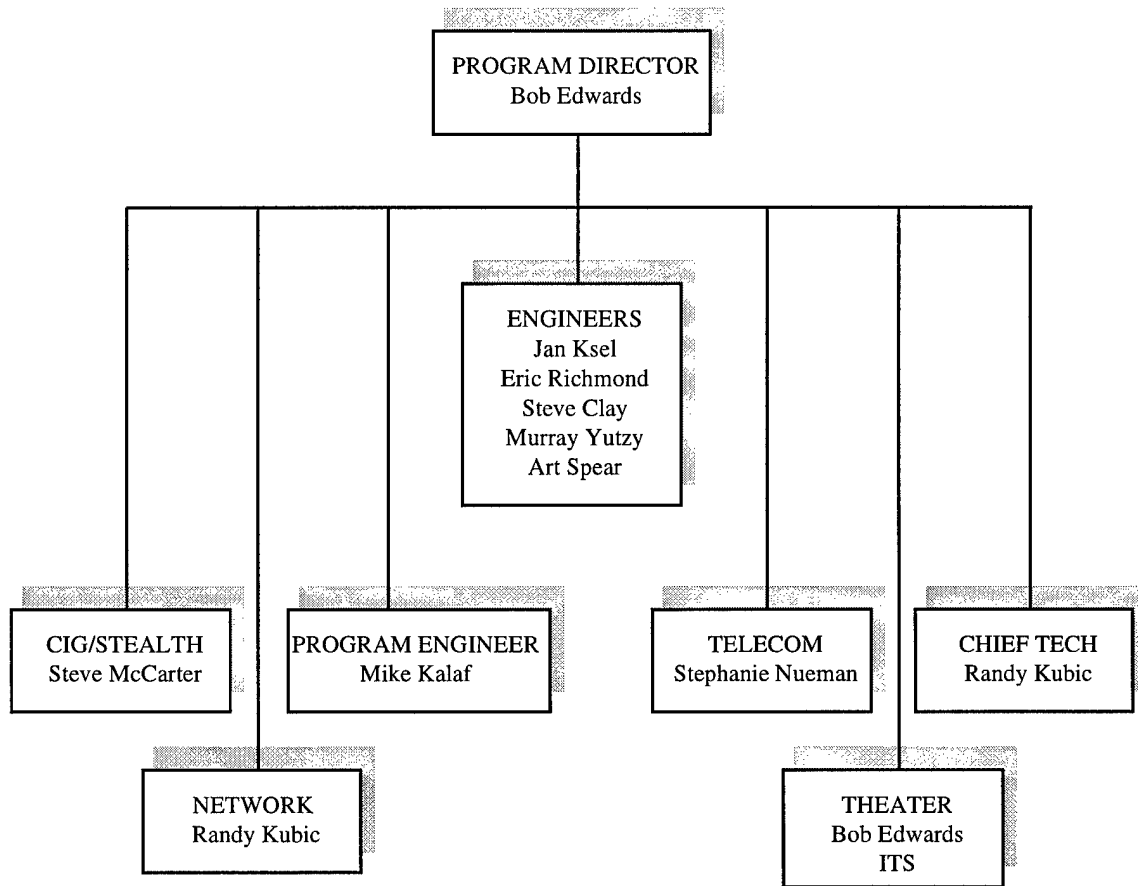


Figure 4.2-2 Lockheed-Martin AE3 Organization

4.3 REPORTING

LMC provided written visibility into the AE3 team activities through the weekly Contractor Progress, Status, and Management Reports and the monthly Program Status Reviews.

4.3.1 Contractor Progress, Status, and Management Report

A Contractor Progress, Status, and Management Report (CPSM) was sent to the Government weekly. This report included information relating to the progress made on each task and the current status of each task.

4.3.2 Contractor Cost/Schedule Status Report

A Cost/Schedule Status Report (C/SSR) was sent to the Government monthly. This report included information relating to the current expenditures made. The format of this report was generated IAW DI-F-6010A and the accepted LMC contractor formats.

4.3.3 Program Management Reviews

The AE3 team supported Program Management Reviews (PMR's) as required during the conduct of the proposed efforts. PMR's were held as required by the Government.

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4.3.4 Scheduling

Scheduling was updated and maintained by the LMC management team. The scheduling process enabled the customer and LMC upper management detailed milestones to be met.

4.4 *IN PROGRESS REVIEWS (IPR)*

In preparation for AE3 there were a total of nine In Progress Reviews (IPR). Items presented at the IPR's were the following: design status; participant's status; integration and test schedules; move-in status; transportation status; and miscellaneous topics. Appendix H contains the IPR minutes.

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APPENDIX A - Acronym List

| | |
|--------|--|
| AAR | After Action Report |
| ABCS | Army Battle Command System |
| ACR | Advanced Concepts Requirements |
| A/C | Air Conditioning |
| ADST | Advanced Distributed Simulation Technology |
| AE3 | Army Experiment III |
| AE4 | Army Experiment IV |
| AGCCS | Army Global Command and Control System |
| AMC | Army Material Command |
| AMP | Ampere |
| AO | Area of Operations |
| ARL | Army Research Laboratory |
| ARPA | Advanced Research Projects Agency |
| ASAS | All Source Analysis System |
| AT&T | American Telegraph and Telephone Company |
| ATACMS | Army Tactical Missile System |
| ATCCIS | Army Tactical Command and Control Information System |
| AUSA | Association of the United States Army |
| BBS | Battalion Brigade Battle Simulation |
| B-ISDN | Broadband Integrated Services Digital Network |
| BDS-D | Battlefield Distributed Simulation - Developmental |
| BPV | Battlefield Planning & Visualization |
| BVP | Battlefield Visualization Product |
| BTU | British Thermal Unit |

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| | |
|---------|--|
| C2 | Command and Control |
| C2V | Command and Control Vehicle |
| C4 | Command, Control, Communications, Computers |
| C4I | Digitization, and Command, Control, Communications, Computers & Intelligence |
| CD-ROM | Compact Disc - Read Only Memory. |
| CDR | Critical Design Review |
| CDRL | Contract Data Requirements List |
| CGM | Computer Graphic Metafile |
| CIG | Computer Image Generator |
| CLCGF | Corps Level Computer Generated Forces |
| Ckts | Circuits |
| CPU | Computer Processing Unit |
| C/SSR | Cost/Schedule Status Report |
| CSSCS | Combat Service Support Control System |
| CSU/DSU | Communication Servicing Unit/Data Servicing Unit |
| CTC | Combat Training Center |
| DBBL | Dismounted Battlespace Battle Lab |
| D&SABL | Depth and Simultaneous Attack Battle Lab |
| D&SA | Depth and Simultaneous Attack Battle Lab |
| DO | Delivery Order |
| DI | Dismounted Infantry |
| DIS | Distributed Interactive Simulation |
| Div | Division |
| DMA | Defense Mapping Agency |
| DOS | Disk Operating System |
| DBBL | Dismounted Battlespace Battle Lab |

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| | |
|--------|---|
| DSBL | Depth and Simultaneous Attack Battle Lab |
| DSI | Defense Simulation Internet |
| ECI | Exhibit Crafts Inc. |
| EUSA | Eighth US Army |
| FAA | Forward Assembly Area |
| FAS | Feasibility Analysis Study |
| FP TOC | Force Projection Tactical Operations Center |
| FSE | Fire Support Element |
| FTP | File Transfer Protocol |
| GES | Greyhound Exposition Services |
| GFE | Government Furnished Equipment |
| GFI | Government Furnished Information |
| HAI | Houston Associates, Inc |
| HQ | Headquarters |
| HVAC | Heating Ventilation Air Conditioning |
| IAW | In Accordance With |
| ID | Identification |
| IDO | IRIX Development Option |
| IDREN | Interim Defense Research Engineering Network |
| IG | Image Generator |
| IP | Internet Protocol |
| IPR | In-Progress Review |
| ISDN | Integrated Services Digital Network |
| ITSEC | Interservice/Industry Training Systems Education Conference |
| ITEMS™ | Interactive Tactical Environment Management System™ |
| ITS | Image Technical Services |

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| | |
|-----------|---|
| JVL | Joint Virtual Laboratory |
| Kbits | Kilobits |
| Kbps | Kilobit per second |
| Kbits/Sec | Kilobits per second |
| KVA | Kilo Volt-Ampere |
| LAD | Logistics Anchor Desk |
| LAM | Louisiana Maneuvers |
| LAM-TF | Louisiana Maneuvers - Task Force |
| LAN | Local Area Network |
| LANDSAT | Land Satellite |
| LHN | Long Haul Network |
| LMC | Lockheed-Martin Corp |
| LOE | Level of effort |
| Log | Logistics |
| LSTAT | Life Support for Trauma And Transport |
| LTTS | Loral Training and Technical Services |
| LWSE | Land Warrior Simulation Extension |
| LWTB | Land Warrior Test Bed |
| M1 | Abrams tank |
| MAC | Macintosh |
| MATMO | Medical Advanced Technology Management Office |
| MAX | Maximum |
| MB | MegaByte |
| M-Bone | Multicast BackBone |
| Mb | Megabits |
| Mb/sec | Megabits per second |

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| | |
|---------|--|
| MCS/P | Maneuver Control Station/Phoenix |
| MDBIC | Missile Defense Battle Integration Center |
| MHZ | Mega Hertz |
| MLRS | Multiple-Launch Rocket System |
| MM3V | Mobile Medical Mentoring Vehicle |
| ModSAF | Modular Semi-Automated Forces |
| MOUT | Mobile Operations in Urban Terrain |
| MPRS | Mission Planning Rehearsal System |
| MSI | Multi-Spectral Imagery |
| NAI/TAI | Names Area of Interest/Target Area of Interest |
| NATO | North Atlantic Treaty Organization |
| NEMA | National Electrical Manufacturers Association |
| NFS | Network File System |
| NPGS | Naval Post-Graduate School |
| NPSNET | Naval Post-Graduate School Network |
| NRaD | Naval Research and Development |
| NTC | National Training Center |
| OAD'94 | October 1994 AUSA Demonstration |
| OAD'95 | October 1995 AUSA Demonstration |
| OCs | Observers/Controllers |
| ODIN | Extension of the SIMNET SAF |
| OPFOR | Operational Forces |
| OSF | Operational Support Facility |
| OTW | Out The Window |
| PC | Personal Computer |
| PDU | Protocol Data Unit |

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| | |
|---------|---|
| PIMS | Portable Integrated Maintenance System |
| PMCAAN | Program Manager, Combined Arms Assessment Network |
| PMO | Program Management Office |
| PMR | Program Management Review |
| POC | Point of Contact |
| PSM | Personnel Status Monitor |
| PVD | Plan View Display |
| RDA | Research Development & Acquisition |
| Res | Resolution |
| RF | Radio Frequency |
| SAF | Semi-Automated Forces |
| SAFOR | Semi-Automated Forces |
| SAT | Satellite; short for Satellite Command |
| SATCOM | Satellite Command |
| SCSI | Small Computer Standard Interface |
| sec | Seconds |
| SGI | Silicon Graphics, Inc. |
| SHAPE | Supreme Headquarters Allied Powers Europe |
| SIK | Sikorsky Aircraft Company |
| Sim | Simulator |
| SIMITAR | Simulation In Training for Advanced Readiness |
| SIMM | Single Integrated Memory Module |
| SIMNET | Simulation Network |
| SME | Subject Matter Expert |
| SOF | Special Operations Force |
| SSDC | Space and Strategic Defense Command |

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| | |
|----------|--|
| STOW | Synthetic Theater of War |
| STRICOM | U.S. Army Simulation Training and Instrumentation Command |
| SWH | Sheraton Washington Hotel |
| T1 | Digital T-carrier service |
| TARDEC | US Army Tank-Automotive Research, Development and Engineering Center |
| TEC | Topical Engineering Center |
| TEL | Transporter/Erector/Launcher |
| TEMO | Training, Exercise and Military Operations |
| TCM | Trauma Control Module |
| TDY | Temporary Duty |
| TI | Texas Instruments |
| TIES | Terrain Information Extraction System |
| TOC | Tactical Operations Center |
| TR | Technical Report |
| TRANSCOM | U.S. Army Transportation Command |
| UAV | Unmanned Air Vehicle |
| UDLP | United Defense Limited Partnership |
| USACOM | U.S. Army Command |
| USAF | United States Air Force |
| VCR | Video Camera Recorder |
| VMAT | Virtual Maintainer |
| VME | Virtual Memory Extension |
| VP | Virtual Prototype |
| VST | Virtual Sand Table |
| VTC | Video Tele-Communications |
| WAN | Wide Area Network |

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WDL

Western Development Labs

WRAMC

Walter Reed Army Medical Center

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APPENDIX B - RESIDUAL EQUIPMENT

The following tables represent the residual equipment that has been acquired under the AUSA delivery Order (materials transferred from ADST I to ADST II and now under control of Lockheed Martin property management on behalf of LAM Task Force.)

| TAG | DESCRIPTION | MODEL | S/N | LOCATIO N | SITE | OWNER | DATE | USER |
|----------|--|-------------------|----------------------|-----------------------------|------|-------|------|------|
| B0000107 | 48" x 27" PALLET JACK WITH HAND CONTROL | 9838T26 | | BAY | LWTB | LAMTF | | |
| B0000106 | 6' WOOD STEP LADDER | 4734540116 | | BAY | LWTB | LAMTF | | |
| B0000100 | ETHERNET, MULTIPORT | MT-800 | 00044300 096050KL | BAY | LWTB | LAMTF | | |
| B0000101 | LEVEL DOLLIES, WOOD HANDLE 5' J BAR | 2750T1 | | BAY | LWTB | LAMTF | | |
| B0000102 | SOLID OAK DOLLIES 30"x18" | 23235T51 | | BAY | LWTB | LAMTF | | |
| B0000103 | SOLID OAK DOLLIES 30"x18" | 23235T51 | | BAY | LWTB | LAMTF | | |
| B0000104 | SOLID OAK DOLLIES 30"x18" | 23235T51 | | BAY | LWTB | LAMTF | | |
| B0000105 | SOLID OAK DOLLIES 30"x18" | 23235T51 | | BAY | LWTB | LAMTF | | |
| B0000099 | TCMB-100/ST POLYETHYLENE TOOL KIT | 50F1839 | | F/E ROOM | LWTB | LAMTF | | |
| A22965 | CHASSIS, TARGET-32 W/PWR SUPPLY | 705-10963- 101 | C11500310 069 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22846 | CPU, MIS | R-3000-12 | 920154 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22847 | CPU, MIS | R-3000-12 | 920159 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22848 | CPU, MIS | R-3000-12 | 920152 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22849 | CPU, MIS | R-3000-12 | 920160 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22850 | CPU, MIS | R-3000-12 | 920153 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |

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| | | | | | | | | |
|--------|------------------------------------|---------------|-------------------|-----------------------|------|-------|--|------|
| A22851 | CPU, MIS | R-3000-12 | 920151 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A20476 | DISPLAY | CD200V-120 | 23297588 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A20477 | DISPLAY | CD200V-120 | 13292728 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22988 | DRAM-8C, 8MB | 890-10298-301 | 754B306A 7029 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22964 | DRIVE, WINDC/FLOPPY | 790-13662-101 | 000104 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22959 | FORCE DRAM 8, MEM BD | 890-10298-301 | 754B306A 7027 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22868 | HUB, AUI - 10 BASE T | AT-3012T | EI624197 | FORT KNOX (ON LOAN) | OSF | LAMTF | | |
| A22869 | HUB, AUI - 10 BASE T | AT-3012T | EJ164197 | HIGH BAY | OSF | LAMTF | | |
| A22870 | HUB, AUI - 10 BASE T | AT-3012T | EI614197 | FORT KNOX (ON LOAN) | OSF | LAMTF | | |
| A22872 | HUB, AUI - 10 BASE T | AT-MR420T | G09D4210 | HIGH BAY | OSF | LAMTF | | |
| A22874 | HUB, AUI - 10 BASE T | AT-MR420T | G06V4211 | ITSEC (ON LOAN) | OSF | LAMTF | | |
| A22887 | HUB, AUI - 10 BASE T | AT-MR420T | B0B74211 | HIGH BAY | OSF | LAMTF | | |
| A22888 | HUB, AUI - 10 BASE T | AT-MR420T | G08B4211 | HIGH BAY | OSF | LAMTF | | |
| A24516 | INTERFACE, PIPELINE 50 | 0700-0260-002 | 4480365 | HIGH BAY | OSF | LAMTF | | |
| A23565 | KEYBOARD | 9500900 | 00033145 8 | CAMBRIDGE (ON LOAN) | CAMB | LAMTF | | CAMB |
| A22875 | KEYBOARD, WYSE | 840358-01 | 407Z4301 051 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22876 | KEYBOARD, WYSE | 840358-01 | 407Z4301 058 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24448 | LASER SCANNER, HANDHELD | LM-300-02 | 74288 | BOB HATTON PWRBK | OSF | LAMTF | | |
| A22899 | MODEM, FAX SPORTSTER 14.4 EXTERNAL | 14,400 | 00026800 07467907 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22940 | MONITOR, 16" MULTI-SCAN | D-M17 | 7203054 | ITSEC (ON LOAN) | OSF | LAMTF | | |

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| A23570 | MONITOR, 20" D-M20 MULTI-SCAN | | 2428379 | CAMBRIDGE (ON LOAN) | CAMB | LAMTF | | CAMB |
| A22852 | MONITOR, VIEWSONIC | 7031 | 16301054 73 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22853 | MONITOR, VIEWSONIC | 7031 | 16301054 76 | SUDDATH (ORL) STORAGE | OSF | LAMTF | | |
| A22855 | MONITOR, VIEWSONIC | 7031 | 16301056 46 | D11/ COL | OSF | LAMTF | | |
| A24138 | PRINTER, DESKJET 320 | C2634A | MY4C12 M0BJ | A12/ HORTON, DENNISU2 4/ K | OSF | LAMTF | | |
| A24528 | ROUTER, CISCO 2500 1E2T | CISCO2501 | 25341645 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24529 | ROUTER, CISCO 4500-M TOPASY | CISCO4500 -M | 45510834 | D13/ GFE ROOM | OSF | LAMTF | | |
| A20975 | SCANNER, IMAGE COLOR | JX-325 | 32102254 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22886 | TERMINAL, WYSE | WY-55 | OLU1450 0686 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24500 | UDS, MOTOROLA | UDSFT1SU | 5271606 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24501 | UDS, MOTOROLA | UDSFT1SU | 5305336 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24503 | UDS, MOTOROLA | UDSFT1SU | 5271603 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24641 | VACCUUM, UPRIGHT | 44245-030 | 09950052 7913 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22618 | VIDEODISC PLAYER, SONY | LDP-1550 | 16088 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24139 | CDROM DRIVE, PCMCIA 2X PORTABLE | KXL-D720 | 5EMDCB 22381 | A12/ HORTON, DENNISU2 4/ K | OSF | LAMTF | | |
| A24530 | CPU, IBM THINKPAD 701C, W/EXTNL DRIVE | 366961 | 2630-5TU | D13/ GFE ROOM | OSF | LAMTF | | ON LOAN STRICOM |
| A22941 | CPU, INDY R4000 | W8C-32 | 08006907 B4D6 | ITSEC (ON LOAN) | OSF | LAMTF | | |
| LM01189 | CPU, INDY R4000 | W8C-32 | 08006908 8CAF | HIGH BAY | OSF | LAMTF | | |
| A23568 | CPU, INDY R4000 | W8C-32 | 08006908 8CB4 | HIGH BAY | OSF | LAMTF | | |
| A22962 | FORCE CHASSIS | SYS68K/T ARGET 32 | C1150031 0066 | D13/ GFE ROOM | OSF | LAMTF | | |

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| A22961 | FORCE DISK CARD | 705-10963- 101 | 105 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22958 | FORCE DRAM 8, MEMORY BD | 890-10298- 301 | 754B306A 7033 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22960 | FORCE DRAM 8, MEMORY BD | 890-10298- 301 | 754B306A 7025 | D13/ GFE ROOM | OSF | LAMTF | | |
| A22871 | HUB, AUI - 10 BASE T | AT-3012T | EJ834194 | FORT KNOX (ON LOAN) | OSF | LAMTF | | ON LOAN |
| A22873 | HUB, AUI - 10 BASE T | AT- MR420T | G0BQ421 0 | FORT KNOX (ON LOAN) | OSF | LAMTF | | ON LOAN |
| A22942 | KEYBOARD | 9500900 | 9514 | HIGH BAY | OSF | LAMTF | | |
| A23567 | KEYBOARD | 9500900 | 00015964 | STRICOM (ON LOAN) | OSF | LAMTF | | |
| A23569 | MONITOR, 20" MULTI-SCAN | D-M20 | 2428380 | HIGH BAY | OSF | LAMTF | | |
| A22764 | MULTIDISK 150, BERNOULLI | DRI0715 | JV942600 15 | PROSE, SUZANNE | OSF | LAMTF | | |
| A24518 | STAND, VIDEO/ AV | BRE10120 | | HIGH BAY | OSF | LAMTF | | |
| A24533 | STAND, VIDEO/ AV | BRE10321 | | HIGH BAY | OSF | LAMTF | | |
| A24534 | STAND, VIDEO/ AV | BRE10321 | | HIGH BAY | OSF | LAMTF | | |
| A22903 | TAPE DRIVE | AR110 | BA279426 | HIGH BAY | OSF | LAMTF | | |
| A24499 | UDS, MOTOROLA | UDSFT1SV | 5305254 | MURRAY YUTZY | OSF | LAMTF | | |
| A24502 | UDS, MOTOROLA | UDSFT1SU | 5271454 | D13/ GFE ROOM | OSF | LAMTF | | |
| A24517 | WIDE BODY TV STAND | BB44-E4 | 50AA0935 | HIGH BAY | OSF | LAMTF | | |
| A22844 | MONITOR | D-M17 | 7202090 | | MWTB | LAMTF | | |
| A24035 | CASE, ARMADILLO | DIM: 32"Lx32"W x29"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24608 | CASE, ARMADILLO, MONITOR | DIM: 60"Lx33"W x32"H | | HIGH BAY | OSF | LAMTF | 6/06/96 | |
| A24609 | CASE, ARMADILLO, MONITOR | DIM: 60"Lx33"W x32"H | | HIGH BAY | OSF | LAMTF | 6/06/96 | |
| A24610 | CASE, ARMADILLO, MONITOR | DIM: 60"Lx33"W x32"H | | HIGH BAY | OSF | LAMTF | 6/06/96 | |
| A24037 | CASE, ARMADILLO, RACK | DIM: 25"Lx25"W x48"H | | TRAILER | OSF | LAMTF | 5/30/96 | |

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| | ASSEMBLY-CLEARCOM EQUIPMENT | | | | | | | |
| A24034 | CASE, ARMADILLO, SGI | DIM: 32"Lx32"W x29"H | | TEMP LOAN | SAIC | LAMTF | 5/17/96 | |
| A24527 | CASE, ARMADILLO, SGI | DIM: 32"Lx32"W x24"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24032 | CASE, ARMADILLO, SGI COMPUTER | DIM: 32"Lx32"W x29"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24033 | CASE, ARMADILLO, SGI COMPUTER | DIM: 32"Lx32"W x29"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24030 | CASE, ARMADILLO, SOUND STORM EQUIPMENT | DIM: 29"Lx31"W x29"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24036 | CASE, ARMADILLO, UTILITIES | DIM: 27"Lx27"W x27"H | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24611 | CASE, ARMADILLO, VCR RACK | DIM: 43"Lx20"W x31"H | | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24469 | CASE (INSIDE), PART OF A24037 | DIM: | | TRAILER | OSF | LAMTF | 5/30/96 | |
| A20412 | CB BASE STATION | 21-1548 | 001046 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20413 | CB BASE STATION | 21-1548 | 3314368 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20414 | CB BASE STATION | 21-1548 | 304303 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20415 | CB BASE STATION | 21-1548 | 33059540 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20451 | CB BASE STATION | TRC-434 | 00002306 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20452 | CB BASE STATION | TRC-434 | 002722 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20453 | CB BASE STATION | TRC-434 | 304102 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A20454 | CB BASE STATION | TRC-434 | 001899 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A24636 | CPU, COMPAQ DESKPRO 590 | 173650-002 | A539HSX 2E185 | | OSF | LAMTF | | |
| A24485 | CPU, GATEWAY 2000 | BABY AT | 2601609 | HIGH BAY | OSF | LAMTF | 6/24/96 | |
| LM00798 | CPU, INDY R4000 | W8C-32 | 08006907 | SIM LAB | OSF | LAMTF | 7/16/96 | |

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| | | | B4DA | | | | | |
| LM01186 | CPU, INDY R4000 | W8C-32 | 08006907 B4D3 | HIGH BAY | OSF | LAMTF | 9/3/96 | |
| LM00812 | CPU, INDY R4000 | W8C-32 | 08006908 927C | | OSF | LAMTF | | |
| A23564 | CPU, INDY R4000 | W8C-32 | 08006908 8CB5 | ROOM M | OSF | LAMTF | 6/24/96 | |
| LM00807 | HUB, AUI - 10 BASE T | AT-3012T | EJ154197 | SIM LAB | OSF | LAMTF | 7/18/96 | |
| LM00858 | HUB, AUI - 10 BASE T | AT-3012T | EJ684194 | COMPUTE R ROOM (203) | OSF | LAMTF | 8/24/96 | |
| A22857 | KEYBOARD | QX201H | K2090861 59 | SUDDATH | OSF | LAMTF | | |
| A22906 | KEYBOARD | 9500900 | 0004093 | | OSF | LAMTF | | |
| A22945 | KEYBOARD | 9500900 | 00009486 | TEMP LOAN TO SAIC | SAIC | LAMTF | 5/17/96 | |
| LM00799 | KEYBOARD | 9500900 | 9931 | SIM LAB | OSF | LAMTF | 7/16/96 | |
| LM00813 | KEYBOARD | 9500900 | 00020770 | ROOM M | OSF | LAMTF | 5/28/96 | |
| LM01194 | KEYBOARD | 9500900 | 00031466 | HIGH BAY | OSF | LAMTF | 9/3/96 | |
| A24525 | KEYBOARD, GATEWAY 2000 | 2191011- 00-004 | 01217555 | HIGH BAY | OSF | LAMTF | 6/24/96 | |
| A24637 | KEYBOARD, COMPAQ | 120663-001 A | 1LJ39CH0 9912 | | OSF | LAMTF | | |
| A15091 | KEYBOARD, W/MOUSE | 3201073-01 | 93361941 16 | L2B1 | OSF | LAMTF | 6/12/96 | |
| LM01002 | KEYBOARD, WYSE | 840358-01 | 407Z4301 057 | SIM LAB | OSF | LAMTF | 8/7/96 | |
| LM01198 | KEYBOARD, WYSE | 840358-01 | 407Z4301 053 | HIGH BAY | OSF | LAMTF | 9/3/96 | |
| A17840 | MASSCOMP, 5600 | 370-99715 | 0-0-2-697 | ROOM S | OSF | LAMTF | 6/12/96 | |
| LM00959 | MONITOR, 16" MULTI-SCAN | D-M17 | 7203053 | FORT SILL, OK | OSF | LAMTF | 8/2/96 | LAMTF |
| A22946 | MONITOR, 16" MULTI-SCAN | D-M17 | 7203052 | L5A1 | OSF | LAMTF | | |
| A24606 | MONITOR, 17" COLOR | D-M17 | 7218293 | LMFS | LMFS | LAMTF | 6/18/96 | |
| LM00811 | MONITOR, 20" MULTI-SCAN | D-M20 | 2413342 | SIM LAB | OSF | LAMTF | 7/18/96 | |
| A23571 | MONITOR, 20" MULTI-SCAN | GDM- 20D11 | 2428374 | TEMP LOAN | SAIC | LAMTF | 5/17/96 | |
| A24612 | MONITOR, COLOR DIAMOND PRO 21" | THN9105S KTK | 50500453 2 | ROOM L | OSF | LAMTF | 6/24/96 | |
| A24613 | MONITOR, | THN9105S | 50500453 | ROOM L | OSF | LAMTF | 6/24/96 | |

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| | COLOR DIAMOND PRO 21" | KTK | 0 | | | | | |
| A24614 | MONITOR, COLOR DIAMOND PRO 21" | THN9105S KTK | 50400327 9 | ROOM L | OSF | LAMTF | 6/24/96 | |
| A24638 | MONITOR, COMPAQ 17" COLOR | 190901-601 | 525CB02 AB085 | | OSF | LAMTF | | |
| A24484 | MONITOR, GATEWAY 2000 | CS1776LE | MH19341 52559 | HIGH BAY | OSF | LAMTF | 6/24/96 | |
| A16604 | MONITOR, SONY | CPD-1201 | 505002 | L2G3 | OSF | LAMTF | | |
| A24535 | MONITOR, SONY | PVM- 8041Q | 2506307 | L5C2 | OSF | LAMTF | 6/24/96 | |
| A19740 | PRINTER, APPLE COLOR | B1029LL/A | CC239HH G | ROOM L | OSF | LAMTF | 2/05/96 | |
| A24537 | RGBS LINE DRIVER | IN2085 | 135815 | L2B2 | OSF | LAMTF | 8/14/96 | |
| A24538 | RGBS LINE DRIVER | IN2085 | 135803 | L2C2 | OSF | LAMTF | 8/14/96 | |
| A24540 | RGBS LINE DRIVER | IN2085 | 135812 | L2C2 | OSF | LAMTF | 8/14/96 | |
| A24541 | RGBS LINE DRIVER | IN2085 | 135806 | L2B2 | OSF | LAMTF | 8/14/968 /14/96 | |
| A15004 | ROUTER, CMR | CMR/R | 205280 | L2A3 | OSF | LAMTF | 6/12/96 | |
| LM00976 | SPACEBALL W/ POWER SUPPLY | 2003 | 01920721 73 | HIGH BAY | OSF | LAMTF | 9/3/96 | |
| A22897 | STEREO AMPLIFIER | MX1500A | 29048143 3 | | OSF | LAMTF | 5/28/96 | |
| A22898 | STEREO AMPLIFIER | MX1500A | 12937077 93 | TRAILER | OSF | LAMTF | 5/28/96 | |
| A24524 | SYNTHESIZED VHF-FM RECEIVER | BR-3 | 05188 | TRAILER | OSF | LAMTF | 5/28/96 | |
| LM01463 | TELEPHONE, CELLULARONE | TFA-18 | 157- 08449462 | L1A3 | OSF | LAMTF | 5/30/96 | |
| A19707 | TERMINAL, WYSE | 900109- 07WY-60 | 01C19908 831 | SUDDATH | OSF | LAMTF | 1/22/96 | |
| A19709 | TERMINAL, WYSE | 900109- 07WY-60 | 01C19A02 114 | SUDDATH | OSF | LAMTF | 1/22/96 | |
| A22881 | TERMINAL, WYSE | WY-55 | OLU1450 0134 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| LM01203 | TERMINAL, WYSE | WY-55 | OLU1450 0649 | HIGH BAY | OSF | LAMTF | 9/3/96 | |
| A22884 | MONITOR, WYSE | WY-55 | OLU1450 0694 | ROOM L | OSF | LAMTF | 6/05/96 | |
| A19736 | TV, 35" TUBE | CS3515R | 529651 | L5C1 | OSF | LAMTF | 5/28/96 | |

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| A19737 | TV, 35" TUBE | CS3515R | 546042 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A19738 | TV, 35" TUBE | CS3515R | 546455 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A19739 | TV, 35" TUBE | CS3515R | 546035 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A24472 | VCR, MITSUBISHI | HS-U500 | 124406M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24473 | VCR, MITSUBISHI | HS-U500 | 125429M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24474 | VCR, MITSUBISHI | HS-U500 | 125426M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24475 | VCR, MITSUBISHI | HS-U500 | 123453M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24476 | VCR, MITSUBISHI | HS-U500 | 123613M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24477 | VCR, MITSUBISHI | HS-U500 | 123743M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24478 | VCR, MITSUBISHI | HS-U500 | 119214M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24479 | VCR, MITSUBISHI | HS-U500 | 125294M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24480 | VCR, MITSUBISHI | HS-U500 | 123671M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A24481 | VCR, MITSUBISHI | HS-U500 | 123646M | TRAILER | OSF | LAMTF | 5/24/96 | |
| A22889 | VID/IO BOX | 1701-30001 | 11154 | | OSF | LAMTF | | |
| A22890 | VID/IO BOX | 1701-30001 | VI011137 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22891 | VID/IO BOX | 1701-30001 | VI011131 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22892 | VID/IO BOX | 1701-30001 | V1011098 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22893 | VID/IO BOX | 1701-30001 | V1011087 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22894 | VID/IO BOX | 1701-30001 | VI011111 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22895 | VID/IO BOX | 1701-30001 | VI011085 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22896 | VID/IO BOX | 1701-30001 | V1011103 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22949 | VID/IO BOX | 1701-30001 | VI011175 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A22950 | VID/IO BOX | 1701-30001 | VI011108 | HIGH BAY | OSF | LAMTF | 5/24/96 | |
| A23507 | VID/IO BOX | 1701-30001 | 10987 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A24042 | CASE, ARMADILLO | | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24526 | CASE, ARMADILLO | | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24038 | CASE, ARMADILLO, 19" RACK | | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24040 | CASE, ARMADILLO, FM | | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24413 | PRINTER, COLOR | 4693DX | B030886 | L5B1 | OSF | LAMTF | 6/11/96 | |
| LM00793 | REPEATER, | AT- | F42Y5196 | SIM LAB | OSF | LAMTF | 7/16/96 | CDF |

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| | CENTRECOM | MR820TR | B | | | | | UPGRADE /ERIC SNYDER |
| A22009 | MONITOR | PVM-1390 | 2013796 | ROOM L | OSF | LAMTF | 6/05/96 | |
| A24647 | HUB | AT-MR124 | G0DR506 2H | L2B2 | OSF | LAMTF | | |
| A24648 | HUB | AT-MR124 | G09N5062 H | L2B2 | OSF | LAMTF | | |
| A24681 | HUB, REPEATER, FOIRL / 10BASE2 | AT- MR127F | G0C75129 A | L2B2 | OSF | LAMTF | 5/30/96 | |
| A24649 | HUB | AT-MR124 | G0ER5062 H | L2B2 | OSF | LAMTF | 6/10/96 | |
| LM01287 | HUB | AT-MR124 | G0F35062 H | RANDY KUBIK | OSF | LAMTF | 9/4/96 | RANDY KUBIK |
| A24680 | HUB, REPEATER, FOIRL / 10BASE2 | AT- MR127F | G0AN512 9A | L2B2 | OSF | LAMTF | | |
| A22867 | HUB, AUI - 10 BASE T | AT-3012T | EJ274194 | 248 / COMMUNI CATIONS CLOSET | OSF | LAMTF | 6/25/96 | |
| A23573 | SPACEBALL | 2003 | 05950324 27 | ROOM L | OSF | LAMTF | 6/24/96 | |
| A24615 | CASE, ARMADILLO | | | QUAD A | OSF | LAMTF | | |
| A25016 | PRINTER, BROTHER | MFL-4500 | L5336780 8 | LMFS | LMFS | LAMTF | | |
| A25021 | SCANNER, MICROTEK SCANMAKER IISP | | | LMFS | LMFS | LAMTF | | |
| A25006 | MODEM, PSION 3FAX | | | LMFS | LMFS | LAMTF | | |
| A25003 | MODEM, PSION 3FAX | | | LMFS | LMFS | LAMTF | | |
| LM01129 | PRINTER, LASERJET 5P | C3150A | USFB2360 43 | ROOM M | OSF | LAMTF | 8/24/96 | |
| LM00221 | CPU, LAPTOP, IBM THINKPAD | 755CDV | 23-791KP | BOB EDWARDS | STRIC OM | LAMTF | 6/19/96 | |
| LM00220 | CPU, POCKET, PSION SERIES 3A | 3A | | JOHN CAMPBEL L | STRIC OM | LAMTF | 6/19/96 | |
| LM00219 | MODEM, PSION 3 | | FDA13146 60 | BOB EDWARDS | STRIC OM | LAMTF | 6/19/96 | |
| LM00228 | PRINTER, LASERJET 5P | C3150A | USFB2359 39 | M3B/2 CUBE23 | OSF | LAMTF | 8/24/96 | |
| LM01153 | PRINTER, | C2145A | US56B110 | M3B-2 | OSF | LAMTF | 8/24/96 | |

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| | DESKJET 850C | | S7 | CUBE 12 | | | | |
| A25053 | SPEAKER | 40-1361 | NONE | BOB EDWARDS | OSF | LAMTF | 8/24/96 | |
| A25054 | SPEAKER | 40-1361 | NONE | BOB EDWARDS | OSF | LAMTF | 8/24/96 | |
| A25072 | BATTERY CHARGER FOR GP300 | HTN9748C | NONE | L5C1 | OSF | LAMTF | 5/15/96 | |
| A22977 | MONITOR, MITSUBISHI | VS-6081 | 000123 | SIM LAB | OSF | LAMTF | 5/20/96 | |
| A22978 | MONITOR, MITSUBISHI | VS-6081 | 000125 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A22980 | MONITOR, MITSUBISHI | VS-6081 | 000201 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A22985 | MONITOR, MITSUBISHI | VS-6081 | 000222 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A22986 | MONITOR, MITSUBISHI | VS-6081 | 000259 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A22987 | MONITOR, MITSUBISHI | VS-6081 | 000266 | SIM LAB | OSF | LAMTF | 5/20/96 | |
| A22979 | MONITOR, MITSUBISHI | VS-6081 | 000199 | HIGH BAY | OSF | LAMTF | 5/20/96 | |
| A22981 | MONITOR, MITSUBISHI | VS-6081 | 000212 | TRAILER | OSF | LAMTF | 5/24/96 | |
| A22982 | MONITOR, MITSUBISHI | VS-6081 | 000218 | TRAILER | OSF | LAMTF | 5/24/96 | |
| A22983 | MONITOR, MITSUBISHI | VS-6081 | 000219 | TRAILER | OSF | LAMTF | 5/24/96 | |
| A22984 | MONITOR, MITSUBISHI | VS-6081 | 000221 | TRAILER | OSF | LAMTF | 5/24/96 | |
| LM00558 | SPEAKER, BOSE, ACCOUSTIMASS 5 SERIES II | 143753 | AM5B0X M595366 | L2A4 | OSF | LAMTF | 5/29/96 | |
| LM00559 | SPEAKER, BOSE, ACCOUSTIMASS 5 SERIES II | 143753 | AM5B0X M492412 | L2A4 | OSF | LAMTF | 5/29/96 | |
| A25075 | BATTERY CHARGER | HTN 9748C | NONE | BOB EDWARDS | OSF | LAMTF | 5/30/96 | |
| A23560 | IF4B WIRE INTERFACE | | | TRAILER | OSF | LAMTF | 5/30/96 | |
| A23559 | SOUND SYSTEM, MAIN STATION | MS-400A | BER-565303 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A23561 | SOUND SYSTEM, ADAPT-A-COM | AC-10H | BER-564839 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A23562 | SOUND SYSTEM, ADAPT-A-COM | AC-10H | BER-564840 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24482 | SINGLE CHANNEL | MODEL 501 | A076113 | TRAILER | OSF | LAMTF | 5/30/96 | |

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| | | | | | | | | |
|---------|--------------------------------|----------------|-----------------|---------------|-----|-------|---------|-------------|
| | INTERCOM SYSTEM | | | | | | | |
| A24483 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076108 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24491 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076112 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24489 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076107 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24496 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076110 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24497 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076109 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24498 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076114 | TRAILER | OSF | LAMTF | 5/30/96 | |
| A24642 | SINGLE CHANNEL INTERCOM SYSTEM | MODEL 501 | A076111 | TRAILER | OSF | LAMTF | 5/30/96 | |
| LM00605 | SPEAKERS, MINI, BOSE | | | L2C3 | OSF | LAMTF | 6/18/96 | |
| LM00606 | SPEAKERS, MINI, BOSE | | | L2C3 | OSF | LAMTF | 6/18/96 | |
| LM00607 | SPEAKERS, MINI, BOSE | | | L2C3 | OSF | LAMTF | 6/18/96 | |
| LM00608 | SPEAKERS, MINI, BOSE | | | L2C3 | OSF | LAMTF | 6/18/96 | |
| A24041 | CASE, ARMADILLO | | | TRAILER | OSF | LAMTF | 6/06/96 | |
| A24994 | KEYBOARD, COMPAQ | RJ101 | | | OSF | LAMTF | 6/19/96 | |
| LM00222 | ZIP DRIVE, 100MB IOMEGA | U 70093 | DRI RB0F51A 0WM | M3B-2 CUBE 11 | OSF | LAMTF | 8/24/96 | BOB EDWARDS |
| LM00223 | SCANNER, MICROTEK | 1108-90-310010 | S5B75082 10 | M3B/2 CUBE 11 | OSF | LAMTF | 8/24/96 | BOB EDWARDS |

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| | | | | | | | | |
|---------|--------------------------------|------------|-------------------|------------------|-----|-------|---------|--------------------|
| LM00224 | MONITOR, COMPAQ | 190901-601 | 532CB02 AG843 | M3B/2 CUBE 11 | OSF | LAMTF | 8/24/96 | BOB EDWARD S |
| LM00226 | CPU, COMPAQ PROLINEA | 222630-004 | A546HSK 4D088 | BOB EDWARDS | OSF | LAMTF | 8/24/96 | BOB EDWARD S |
| LM00225 | KEYBOARD, COMPAQ | RT101 | 1GD39CS 22943 | M3B-2 CUBE 11 | OSF | LAMTF | 8/24/96 | BOB EDWARD S |
| LM01302 | PHONE, DIGITAL, CORDLESS | 9100 | 10079513 047 | DONALD BLOOM | OSF | LAMTF | 9/9/96 | DONALD BLOOM |
| LM01303 | PHONE, DIGITAL, CORDLESS | 9100 | 10079513 048 | DONALD BLOOM | OSF | LAMTF | 9/9/96 | DONALD BLOOM |
| LM01304 | PHONE, DIGITAL, CORDLESS | 9100 | 10305960 01781 | DONALD BLOOM | OSF | LAMTF | 9/9/96 | DONALD BLOOM |
| LM01305 | PHONE, DIGITAL, CORDLESS | 9100 | 10305960 01841 | DONALD BLOOM | OSF | LAMTF | 9/9/96 | DONALD BLOOM |

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APPENDIX C - IMMERSIVE THEATER SCENARIO

WARRIORS IN THE INFORMATION AGE

Script for a Live Multi-Media Presentation

3 October 1996

(new3oct.doc)

Changes are annotated in bold letters. On left side screen 1,2,3 refer to the biggest screens in the display and Monitors A, B, C refer to smaller screens used for live picture views or to enrich the main picture on the bigger screens. The big screens are the focus of the theater presentation and they use multi-media including live virtual simulation, live action and video to deliver the message.

The pre-show graphics consisted of a collage of action soldier footage on screens **1,2,3** with STRATCOM messages and quotes on monitors **A, B, C** and annotated over the video. Messages and quotes to follow. At the proper time before the show begins the screens all fade to either black or blue to get the audience's attention. The first set of images appear on the screens 5 seconds before the narrator begins.

1 Videotape of soldiers operating computer equipment in the 21st Century **AE III** annotated over the screen.

1. PRESENTER (0:00-0:05): Good morning/afternoon. I'm _____. Welcome to the Army's Warriors in the Information Age presentation.

2. Jane's Apache shoot. ARMY EXPERIMENT III annotated over the screen.

3 Videotape of soldiers operating computers in C2V at JVL. **AE III** annotated over the screen. Monitors **A, B, C** blank screen unless enrichment needed.

Same as script #1 initially, fades to below at words, "The technologies".

1. Videotape of TI Scout Vehicle. STAND-ALONES and a list of those experiments annotated over the screen.

2. Same as script #1.

3. Videotape of DBBL soldier on mobility platform. THEATER (SBE) and a list of those experiments annotated over the screen.

Monitor **A** - Graphic chart - SCOUT VEHICLE, COTILLION BALLROOM, Monitor **B** blank screen, Monitor **C** - Graphic chart - SOLDIER TRAINING IN VIRTUAL SIMULATION, FORT BENNING, GA.

2. PRESENTER (0:06-0:22): We're here to show you America's Army applying Information Age technology -now -to prepare for the 21st Century battlefield. Our soldiers are training with these new technologies -- including simulations -- And over the next twenty minutes, you'll see them in action -- much of it, live.

Same as script # 2.

3. PRESENTER (0:23-0:34): **This is a live distributed show where anything can happen so we'll have a good time!**

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Same as script # 2.

Live video **VTC** feeds of troops in simulators,

1. Fort Benning, GA
2. Fort Leavenworth, KS after 10 seconds fades to San Jose, CA.
3. Bozeman, MT
1. Fort Benning, GA
2. San Jose, CA
3. Bozeman, MT

Monitor **A, B, C**: Graphic chart of network diagram, showing how sites are linked. Location titles annotated over the top of the monitor screen synchronized with 2 change.

1. Videotape of 21st Century TOC with officer working at computer equipment.
 2. Videotape of annotation 21ST CENTURY.
 3. Videotape of male and female officers in 21st Century TOC gesturing to computer display.
- Monitors **A, B, C** blank screen unless enrichment needed.

1. Videotape of CDR in TOC with computer.
 2. Videotape of tank with embedded trainer.
 3. Videotape of equipment design in virtual world.
- Monitors **A** - Graphic chart - COMPRESS PLANNING AND DECISION-MAKING CYCLES, Monitor **B**, - Graphic chart - REAL TIME DOMINANT SITUATIONAL AWARENESS, Monitor **C** - Graphic chart - TEST IN SIMULATION BEFORE YOU BUILD

4. PRESENTER (0:35-0:58): Much of what you'll see here will be new, and you may have some questions. We can't stop our live show while it's running, but we will have time for questions a little later. And you can learn more about these technologies as you move next door to the 21st Century **Tactical Operations center , or TOC**, and from the hands-on equipment here in the ballroom -- as well as from the CD you'll receive when you leave here today

5. PRESENTER (0:59-1:26): Now, let's talk about **the connectivity of this** special experiment! Here in the theater, you'll be seeing four live video feeds and seven live simulation feeds, coming from eight remote sites. Participants at the sites will communicate with multiple simulations over experimental networks, and interact in real time. Most will be linked on the same simulated battlefield, although they're up to a thousand miles apart. In the future, this will be routine, instead of a special experiment.

6. PRESENTER (1:27-1:37): The vignettes you're about to see take place in the 21st Century -- only four years away. By then, some of those officers you saw outside could be battalion or higher level commanders.

7. PRESENTER (1:38-2:06): They'll train and fight using information and simulation systems designed to compress planning and decision making cycles. Information technology will give them real time dominant situational awareness of the battlefield... and the ability to plan and act faster than our enemies can react. These technologies will also aid logisticians in managing the needs of a force projection Army... and future combat and materiel developers in testing new equipment, before it's ever built.

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1,2,3 Videotape of high energy, soldiers/combat footage annotated with STRATCOM messages such as Soldiers Are Our Credentials. Verbiage to follow.

Monitor **A, B, C** Quotes and STRATCOM messages. Verbiage to follow

1-3 and Monitors **A, B, C** same as script # 8

8. PRESENTER (2:07-2:17): We're exploiting these technologies to give our soldiers the best tools possible -- so they can survive and win on the battlefield of the next century.

9. PRESENTER (2:18-2:30): While no technology can make our soldiers invincible... these new tools can make them more efficient and effective...so we can continue to overmatch our adversaries and be better able to respond to our nation's needs.

TRANSITION FROM INTRODUCTION TO HISTORICAL PERSPECTIVE. (Fade to blank screen)

1,2,3 Videotape of collage of commander's metric tools (maps, binoculars, plotting and measuring devices, etc.) from the Civil War forward to Desert storm. Monitor **A, B, C** blank screen.

10. PRESENTER (2:31-2:39): But before we enter the future, let's set a historical perspective. Since ancient times, all ground commanders have grappled with the same three questions:

1-3 Same as script # 10 annotated with **1** - Where am I? **2** - Where are my friends? **3** - Where is the enemy?

11. PRESENTER (2:40-2:45): Where am I? Where are my friends? And where is the enemy?

Monitors **A** - Graphic chart - WWI Corps frontage chart also showing lethality ranges and speed of battle graph.

Monitor **B** - Graphic chart - WWII Corps frontage chart also showing lethality ranges and speed of battle graph.

Monitors **C** - Graphic chart - Desert Storm Corps frontage chart also showing lethality ranges and speed of battle graph.

1,2,3 same as script # 11.

Monitor **A, B, C** same as script # 11

12. PRESENTER (2:46-3:14): The commander who can best answer these questions in the shortest time has dominant situational awareness. That commander knows where his or her units are, where friendly units are and where the enemy is...and he can plan and act faster than the enemy can react, resulting in victory. Throughout history, the commander's ability to answer those three questions and gain dominant situational awareness has varied with the size, lethality and speed of the battlefield.

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13. NOT USED

14. NOT USED

15. NOT USED

1-3 Videotape of stock battle action from WWI, WWII and Desert Storm. At the words "exponentially" the three questions annotate on **1** - Where am I? **2** - Where are my friends? **3** - Where is the enemy?

Monitors **A, B, C** - same as script # 11

16. PRESENTER (3:15-3:36): In the past hundred years, the size, lethality, and speed of the battlefield have expanded exponentially. The ability to gather battlefield information has kept up with that expansion -- but the sheer amount of data is often overwhelming. The challenge today and in the future is how to fuse or distill that data into usable information -- faster than the enemy can.

1-3 Same as script # 16, Monitor **A, B, C** same as script # 11

17. PRESENTER (3:37-3:58): By capitalizing on information technology, the Army is gaining that capability. Our 21st Century commanders will see more of the battlefield and communicate faster -- but most importantly, they'll use the data they gather more effectively... giving them REAL TIME dominant situational awareness to plan and execute faster than the enemy can react.

1 TI Simulator, live video feed VTC (Bozeman, MT)

2 MCS/P icon whiteboard view from JVL of the Corps laydown to brigade level.

3 C2V live video feed VTC (Fort Leavenworth) showing corps commander working at terminal.

Monitors **A** - 21ST CENTURY TOOLS, LIVE FROM BOZEMAN, MT, Monitor **B** - Graphic chart 21ST CENTURY COMMANDER'S REAL TIME DOMINATE SITUATIONAL AWARENESS PICTURE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **C** - Graphic chart - 21ST CENTURY TOOLS - LIVE FROM FORT LEAVENWORTH, KS

18. PRESENTER (3:59-4:20): Our 21st Century commanders will visualize the battlefield on electronic operations maps updated continuously with key data. They will know where they are, where their friends are and where the enemy is. They will be able to compress their planning and decision cycles, utilizing more accurate information.

TRANSITION TO VIGNETTE 1.

1,2,3 and Monitor **A, B, C** Same as script # 18
At 4:30(time) bring up script # 20 scenes

19. PRESENTER (4:21-4:40): In our first vignette, you'll see how these technologies help the corps commander compress planning and decision cycles in order to attack multiple targets at multiple locations nearly

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simultaneously in a deep battle_situation. We will condense the duration of the battle from hours to minutes, for the sake of time.

- 1 Virtual view of JSTARS airplane.
- 2 Video of JSTARS MTI monitor feed annotated with their purpose.
- 3 Live video feed -- JVL VTC of ASAS operator
- Monitor A - JSTARS AIRCRAFT- LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor B - Chart depicting the various Common ground Station intelligence products; Monitor C - Graphic chart - **ASAS OPERATOR REVIEWING JSTARS DATA, LIVE FROM FORT LEAVENWORTH, KS**

1-3 and Monitor A, B, C same as script # 20.

20. PRESENTER (4:41-5:11): To detect and accurately portray a major enemy attack, the Corps depends on intelligence collection systems, such as the joint Army /Air Force JSTARS aircraft. These systems collect and downlink huge quantities of **organized** intelligence data to Common Ground Stations. Then, skilled operators use sophisticated analysis technologies, such as the All Source Analysis System, to select, distill, and display the key information from that vast collection of data.

21. PRESENTER (5:12-5:22): The corps commander uses this information to monitor and predict the enemy's actions and to plan the attack throughout the depth of the enemy's sector.

22. NOT USED

- 1 & 3 Virtual tethered view of Predator UAV flying.
- 2 **Video of virtual UAV payload view of tank column.**
- Monitor A - Graphic chart - PREDATOR UAV FLYS OVER THE BATTLEFIELD-LIVE SIMULATION FROM FORT LEAVENWORTH, KS
- Monitor B - UAV VIEW OF BATTLEFIELD;
- Monitor C - Graphic chart - Picture of a Predator UAV -annotated PREDATOR UAV

23. PRESENTER (5:23-5:42): The commander's first move is to detect and engage high priority targets deep behind the enemy's line. An unmanned aerial vehicle, or UAV, concentrates on the area indicated as critical by the JSTARS intelligence. This helps the corps to determine the thrust of the main attack, and to look for high value targets.

- 1,2,3 Blank screen, then after SCUD launch from Monitor A **video of** attached SCUD missile virtual picture which reaches top of apogee on screen 2 before script # 25 begins, Screen 3 stays blank.
- Monitor A - video of SCUD launch, annotated SCUD LAUNCH; Monitor B - video tape acquisition sequence showing SCUD launch detection on Commander's Real Time Display, annotated **COMMANDER'S REAL TIME DISPLAY SHOWS LAUNCH**; Monitor C -

24. PRESENTER (5:43-5:52): Meanwhile, national reconnaissance assets observe an enemy SCUD launch and transmit the information to the corps.

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video of Patriot launcher preparing to launch annotated PATRIOT LAUNCHER.

1,2,3 Video of attached SCUD missile virtual picture continue from script # 24 to **3** and ends abruptly at the edge of Screen 2.

Monitor **A** - continued video of script # 24 annotated SCUD TEL; Monitor **B** - Videotape of appropriate ADA monitor, Patriot tracking, launch and destruction annotated PATRIOT TRACK, LAUNCH AND SCUD DESTRUCTION; Monitor **C** - Patriot launch switches to Desert Storm or other video footage showing explosion like one missile hitting another, annotated PATRIOT DESTROYS SCUD.

1,2,3 Virtual view of Comanche team turning and flying in a new direction. Overlaid with audio track.

Monitor **A,C** Still pictures of Comanche helicopter annotated COMANCHE HELICOPTER, Monitor **B** Graphic chart - COMANCHE'S VIEW OF THE BATTLEFIELD - LIVE SIMULATION FROM FORT LEAVENWORTH, KS;

1-3 Virtual view of SCUD TEL and forward operating base as seen from Comanche. Monitor **B** - Graphic Chart - COMANCHE VIEW OF SCUD TEL AND FORWARD OPERATING BASE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitors **A&C** - blank screen

1-3 Same as script #27

Monitor **A,C** Video clip of TOC scene, showing incoming intelligence messages displayed on monitors. Monitor **B** - Graphic chart depicting an electronic call for fire

1-3 Same as script #27

Monitor **A, B, C** same as script #28

1,2 Same as script # 27.1.

3 Video of virtual view of attached ATACMS flight and target impact.

25. PRESENTER (5:53-6:03): Corps missile defense units receive the launch information, acquire the enemy missile, launch and destroy it.

26. PRESENTER (6:04-6:15): The corps diverts a Comanche team on a deep reconnaissance mission to find and destroy the enemy **SCUD launcher.** The Comanches turn and begin to search for the **SCUD launcher.**

27. PRESENTER (6:16-6:26): Within minutes, the Comanches locate it, near a forward operating base with the critical missile reload trucks.

28. PRESENTER (6:27-6:40): The Comanche team leader sends a digital call for fire message directly to the supporting ATACMS unit to destroy the forward operating base.

29. PRESENTER (6:41-6:49): The corps has cleared the target, and the ATACMS firing unit launches.

30. PRESENTER (6:50-7:05): It would take the missile three to five minutes to reach the target. We will only show you a part of the

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Monitor **A** - Graphic Chart - COMANCHE'S VIEW OF SCUD TEL AND FORWARD OPERATING BASE - SIMULATION FROM FORT LEAVENWORTH, KS AND HUNTSVILLE, AL, Monitor **B** - blank screen; Monitor **C** - Graphic Chart - ATACM'S MISSILE FLIGHT AND TARGET IMPACT - SIMULATION FROM FORT SILL, OK AND HUNTSVILLE, AL

flight and the impact. (Sound of missile impact)

31. NOT USED

1&2 Tethered virtual view showing TEL target left and Comanche attacking. (SGI)

3 Comanche thermal sensor view of target being attacked with Hellfire flyout. (SGI)

Monitor **A** - Graphic chart - COMANCHE'S VISUAL VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **B** - blank screen; Monitor **C** - COMANCHE'S THERMAL VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

32. PRESENTER (7:06-7:21): The ATACMs missile destroys most of the Forward Operating Base. The Comanche team conducts a target damage assessment, detects a second **SCUD launcher**, and rapidly destroys it.

1,3 black screen

2 Thermal sensor virtual view of MRLs, BRDM and trucks moving into the team's surveillance area.

Monitor **A,C** - Still pictures of a Special Forces reconnaissance team hiding, Monitor **B** - Graphic chart - THERMAL VIEW OF ENEMY HEAVY ROCKET LAUNCHERS - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

33. PRESENTER (7:22-7:40): While the Comanches complete their attack, another sensor is at work -- a Special Forces reconnaissance team. The team uses thermal sights to detect targets through smoke and obscurants along an enemy route. They burst-transmit the information to their headquarters.

1&3 Virtual view of F-15's flying cap over Marine strike aircraft. **2** same as script # 33

Monitor **A&C** - graphic chart - AIR FORCE CAP COVERING MARINE STRIKE AIRCRAFT - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **B** same as script # 33.

34. PRESENTER (7:41-7:51): The Corps wants to attack the rocket systems as part of their counter fire efforts. So, it diverts Marine strike aircraft under Air Force counter-air **patrol** to do the job.

1,3 same as script # 34

2 Thermal sensor virtual view of attack aircraft bombing the rocket launchers as seen from Special Forces point of view.

Monitors **A, B, C** - video of pilots in aircraft

35. PRESENTER (7:52-8:00): The Marine strike aircraft attack the enemy rocket site, while the reconnaissance team assesses damage.

1 Tethered virtual view from UAV of enemy

36. PRESENTER (8:01-8:09): As the enemy

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armored forces.

2. Datalog of virtual UAV view of battlefield.

3 Live video feed of JVL VTC of commander viewing a screen in his C2V.

Monitor **A** - Graphic Chart - ENEMY ARMOR - LIVE SIMULATION FROM FORT LEAVENWORTH, KS, Monitor **B** - Graphic chart - UAV VIEW, Monitor **C** - Graphic chart - CORPS COMMANDER, LIVE FROM FORT LEAVENWORTH, KS

1,2 and Monitor **A,B** same as script # 36

3 Video feed of BVP screen in JVL

Monitor **C** - Graphic chart - INTELLIGENCE PICTURE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

1,2,3 Virtual, tethered view of an attack company approaching armored column.

Monitor **B** - Graphic Charts - ATTACK TEAM'S VIEW - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **A,C** - blank screen

1,2,3 Virtual, tethered view of Comanches firing on anti-aircraft systems, weapon flyout and target destruction.

Monitors **A,C** blank; Monitor **B** Graphic chart - COMANCHES DESTROY ENEMY AIR DEFENSE - LIVE SIMULATION FROM FORT LEAVENWORTH,

1,2,3 Virtual, tethered view of AH-64D Longbow Apaches firing on the armored column, weapon flyout, and target destruction. Monitor **A, B, C** - video or still photos of Apache helicopters firing ordnance.

TRANSITION OUT OF ACTION, INTO VIGNETTE 1 SUMMARY.

1&3 Videotape clips from rehearsal. Monitors **A, B, C** Collage of segments reprising key parts of the vignette.

2 Graphics supered over similar images. Graphic listing main points:

-- Information Technology fuses and distills key information from overwhelming amounts of data

rocket launchers burn, the Corps commander prepares to attack an enemy armor threat.

37. PRESENTER (8:10-8:17): The UAV sensors confirm the target. The commander rechecks the intelligence picture to confirm attack timing. It looks good.

38. PRESENTER (8:18-8:27): The commander directs the Aviation Brigade to execute the attack helicopter battalion's plan. They will attack the armored column.

39. PRESENTER (8:28-8:42): Comanches destroy enemy air defense systems. The AH-64D Longbow Apaches coordinate targeting data digitally and engage the armored column at maximum targeting range.

40. PRESENTER (8:43-8:53): After the engagement, the Corps receives reports of enemy destruction from the Comanche and UAV.

41. PRESENTER (8:54-9:15): So, that's what elements of a corps level battle might look like in the 21st Century. It'll be a fast, lethal, complex fight, that takes place over thousands of square miles of terrain. Our Corps commander used real time dominant situational awareness to act faster than the enemy could react by engaging and destroying multiple high

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-- Dominant Real Time Situational Awareness compresses decision and planning cycles
 -- Information technology provides:

- increased lethality
- increased speed and mass of attack

Monitor **A, B, C** - Collage of segments
 reprising key parts of vignettes

1,2,3 Video of 21st Century TOC
 Monitor **A, B, C** Same as script # 41

42. PRESENTER (9:16-9:23). When you visit the 21st Century TOC next, you can see some of the actual equipment we talked about in this operation.

1,2,3 same as script # 42
 Monitor **A** - Graphic Chart - TASK FORCE XXI, Monitor **B** - Graphic chart - NATIONAL TRAINING CENTER, Monitor **C** - Graphic Chart - MARCH, 1997

43. PRESENTER: (9:24-9:38) **The Army will learn more about dominant situational awareness during a brigade-level Advanced Warfighting Experiment at the National Training Center. There is more information in your CD.**

TRANSITION TO VIGNETTE 2

1&3 Chart showing line diagram from Corps to BDE

2 Monitor feed BPV icon corps map zooms down to BDE level and deaggregates.

Monitor **A&C** blank screen; Monitor **B** - graphic chart - LIVE SIMULATION FROM FORT LEAVENWORTH, KS

44. PRESENTER (9:39-9:45): Let's move on now from the deep battle to the close battle, from the corps to a combat maneuver brigade.

1 Feed from monitor of BVP screen with brigade laydown.

2 Feed from monitor of MCS/P (file 45.2) shows warning order and brigade laydown.

3 Live video feed of JVL C2V with MCS/P view of brigade laydown (OTS)

Monitor **A** - Graphic chart - BRIGADE ZONE - LIVE SIMULATION FROM FORT LEAVENWORTH, KS; Monitor **B** - Graphic chart - WARNING ORDER; Monitor **C** - Graphic chart - BRIGADE COMMANDER'S VEHICLE, LIVE FROM FORT LEAVENWORTH, KS

45. PRESENTER (9:46-10:07): In this vignette, we'll focus again on situational awareness and planning and dissemination of orders among TOCs linked by simulations. Here, again, information technology will dramatically improve our speed and accuracy in training and combat. It will help make our soldiers virtual combat veterans, before they engage the enemy in actual combat.

1,2,3 Monitor **A, B, C** same as script # 45 until script time 10:18 then **1** fades to live VTC Bozeman, MT showing OTS of Bn Cdr watching appliqué screen. Screen **2** switches from MCS/P file 45.2 to whiteboard file 48.2.

46. PRESENTER (10:08-10:23): As we join the brigade commander, battle is imminent. He sends a detailed warning order to his commanders and their TOCs to prepare them for a possible counterattack. His message

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Monitor A - Graphic chart - BATTALION
COMMANDER'S VEHICLE, LIVE FROM
BOZEMAN, MT

appears almost instantly as a graphic on their
computer screens.

3 and B, C stay same as script # 45.

1 Live VTC Bozeman, MT showing OTS of
Bn Cdr watching appliqué screen. Monitor A -
Graphic chart - BATTALION
COMMANDER'S VEHICLE, LIVE FROM
BOZEMAN, MT

47. PRESENTER: (10:24-10:33)
Immediately, commanders and staffs at two
levels share the same information. They're
ready to conduct simultaneous planning using
simulations.

2&3 Monitors B, C Same as script #45.

1 and A Same as script #47

48. PRESENTER (10:34-10:48): While the
subordinate commanders study the warning
order, the brigade commander uses automated
planning tools to analyze various courses of
action. He and his staff wargame the
counterattack courses of action using a
simulation.

2 BPV view showing rehearsal at very slow
speed. 3 Same as script # 45

Monitors B - COUNTERATTACK COURSE
OF ACTION - LIVE SIMULATION FROM
FORT LEAVENWORTH, KS; Monitor C
Same as script #45.

1 and A same as script # 47

49. PRESENTER (10:49-11:05): Next, he
electronically rehearses it with the battalion
commanders -- again using a simulation-- so
they can see and hear how the commander
expects the battle to unfold, and coordinate
critical points.

2 Feed from BPV monitor of rehearsal.

3 Same as script #45

Monitor B - Graphic Chart - REHEARSAL
USING LINKED SIMULATION - LIVE
SIMULATION FROM FORT
LEAVENWORTH, KS, Monitor C - same as
script #45

1. same as script # 47

50. PRESENTER (11:06-11:22): When he's
satisfied, the brigade commander electronically
disseminates the final order with any changes
discovered during the rehearsal. This ability to
plan and rehearse simultaneously between
command levels drastically reduces planning
cycles.

2. same as script #49

3. same as script #45

Monitor A - same as script #47; Monitor B -
same as script #49, Monitor C - same as script
#45

1 Virtual view of enemy force entering view of
scout. (SGI)

51. PRESENTER (11:23-11:38): An hour
later, a scout detects enemy armor moving
toward a key village. This could trigger the
counterattack. The commander confirms the
threat through his intelligence feeds. He
directs the brigade to execute the counterattack
they just rehearsed.

2 Feed from monitor of MCS-P icon view 51.2,
showing common situational awareness screen
of enemy threatening village.

3 Live video feed of JVL C2V showing BDE
CDR

Monitor A - graphic chart - LIVE
SIMULATION FROM BOZEMAN, MT,
SCOUT DETECTS ENEMY; Monitor B -
Graphic chart - INTELLIGENCE PICTURE -
LIVE SIMULATION FROM FORT

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LEAVENWORTH, KS, Monitor C- Graphic chart - BRIGADE CDR'S COMMAND VEHICLE, LIVE FROM FORT LEAVENWORTH, KS

1&2 Virtual view of mechanized team with attachments advancing past working engineer vehicles.

3 Virtual view close-up of the UD Bradley fighting vehicle.

Monitor A - still picture of Grizzly engineer vehicle annotated GRIZZLY ENGINEER VEHICLE; Monitor B - still picture of Wolverine engineer vehicle annotated WOLVERINE ENGINEER VEHICLE; Monitor C - still picture of UD Bradley annotated M2A3 BRADLEY

1-3 and Monitor A, B, C Same as script #52

Live action: The PRESENTER circles the UD Bradley on **3** with a laser pointer.

DATA BASE SWITCHES TO DBBL

1,2 Virtual view from rear of Bradley and support team overwatching the assault team approaching the village. At the words, "clear the village" the squad receives sniper fire from the village and begins immediate action drill.

3 Live video VTC view of soldier on mobility platform at Fort Benning.

Live Action. (PRESENTER points to the mobility platform soldier's image on the virtual view, Monitors A and B as appropriate to the script)

Monitor A - PVD- bird's eye view of infantry platoon's action annotated - LIVE FROM FORT BENNING, GA; Monitor B - blank screen until the squad receives fire then video tape monitor feed of fire team leader's IHAS SITREP message to squad/platoon leader reporting receiving fire. Message annotated - LIVE FROM FORT BENNING, GA; Monitor C - Graphic chart - SOLDIER TRAINING IN VIRTUAL SIMULATION, LIVE FROM FORT BENNING, GA.

1,2 Virtual view from rear of Bradley and

52. PRESENTER (11:39-11:49): The plan calls for a mechanized task force to seize the village and block the enemy's advance. Lead elements of the task force conduct an in-stride breach, with engineer assistance, as they move toward the village.

53. PRESENTER (11:50-11:59): I want to bring your attention to this M2A3 Bradley fighting vehicle with a different turret -- we'll talk more about it later.

DATA BASE SWITCHES TO DBBL

54. PRESENTER (12:00-12:31): The infantry dismounts to clear the village and begins to receive sniper fire. The soldier you see live from Fort Benning is using virtual simulation and head-mounted automated command and control equipment. **He is the first soldier in the column, here in the simulation.** (PRESENTER points to the mobility platform soldier's image on the virtual view). Throughout this portion of the battle you will see a live battlespace overview on this monitor (PRESENTER points to Monitor A) and various views of the soldiers' command and control systems on this monitor. (PRESENTER points to Monitor B) These include messages, calls for fire, and **map displays.**

55. PRESENTER (12:32-12:55): The platoon

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support team laying down a base of fire for the assault team which continues its immediate action drill.

3 Same as script # 54

Monitor A - Same as script # 54. Monitor B - video tape monitor feed of platoon leader's view of tactical map (shows his battlespace) annotated - LIVE FROM FORT BENNING, GA; Monitor C - same as script #54.

1,2 same as script # 55.

3 same as script # 54.

Monitor A,C same as script # 55

Monitor B - video feed of Platoon Leader's IHAS SITREP to the platoon indicating an approaching enemy armored column, annotated - LIVE FROM FORT BENNING, GA.

1,2 Assault element reaches building ,

3 same as script # 54.

Monitor A,C same as script # 55

Monitor B - video monitor feed of IHAS call for fire annotated - LIVE FROM FORT BENNING, GA.

1,2 Assault element enters building, traverses the stairs and negotiates obstacles while searching for the sniper, kills sniper.

3 same as script # 54.

Monitor A - Same as script # 55. Monitor B - video monitor feed of fire team leader's rifle view annotated - LIVE FROM FORT BENNING, GA; Monitor C - **Graphic Chart - RIFLE VIEW: PROVIDES ADVANCED SCANNING AND LASING CAPABILITIES TO INDIVIDUAL SOLDIERS.**

1,2 view of soldier observing enemy tanks and the results of the fire on the enemy force. Sends adjustments on command and control device. His actions same as soldier on screen

3

3 Soldier on mobility platform observing enemy tanks and the results of the fire on the enemy force. Sends adjustments on command and control device.

leader's automated command and control system provides him with real time dominant situational awareness. He uses it to direct his units to destroy known enemy. This capability enhances the efficiency and lethality of his platoon, and reduces the probability of fratricide. Using similar information systems, fire team and squad leaders keep their commanders apprised of the situation.

56. PRESENTER (12:56-13:12): The platoon leader receives a SITREP from his commander indicating an enemy armored column approaching the village. Using his control system, he can constantly monitor his units, friendly units, and known enemy units. He can automatically update his subordinates with graphics, unit locations and orders.

57. PRESENTER (13:13-13:21): As the assault continues, he executes a call for indirect fire on his command and control device to block the enemy armor column until the platoon clears the village.

58. PRESENTER (13:22-13:46): After the supporting fires are lifted, the assault element enters the building. **By scanning the room with his rifle view from a protected position, the fire team leader** locates and kills the sniper. The platoon leader now updates the platoon using his command and control headset.

59. PRESENTER (13:47-14:04): The fire team leader observes the artillery fire on the approaching enemy armor. **Placing his weapon reticle on the target and activating his laser rangefinder, he automatically sends the firing battery and his chain of command fire adjustments.**

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Monitor A - PVD view of platoon in village continuing to engage enemy elements annotated - LIVE FROM FORT BENNING, GA; Monitor B - Same as script #58 until fire team leader switches to rifle view message of IHAS automated fire adjustments; Monitor C - same as script #58

1,2,3 Virtual view from Bradley gunner's viewpoint providing supporting fires for assault element against a building. A large explosion causes the squad to hit the ground. They get up and avoid a large crater to get to building. Supporting fires shift to the next building.

Monitors A Graphic chart - DYNAMIC TERRAIN MODELING (DTM) IMBEDDED INTO C4I SYSTEMS AUTOMATICALLY DISPLAYS TERRAIN CHANGES BASED ON INTELLIGENCE UPDATES; Monitor B - Graphic chart - DYNAMIC TERRAIN MODELING(DTM) ALTERS ELEVATION IN REAL TIME BASED ON WEAPONS EFFECTS MODELS; Monitor C - M2A3 BRADLEY SUPPORTING ASSAULT ELEMENT - LIVE SIMULATION FROM ARMY RESEARCH LAB, WASHINGTON, DC..

1,2,3 Virtual view from Bradley gunner's viewpoint showing support fires going into next building. Squad emplaces explosive, detonates them and tactically enters the building.

Monitor A - FUTURE DTM WILL SUPPORT WEAPONS MODELING SIMULATIONS TO REDUCE ACQUISITION TIME AND MINIMIZE ENVIRONMENTAL IMPACT; Monitor B - Graphic chart - DTM ALSO ALTERS BUILDING STRUCTURES IN REAL TIME BASED ON WEAPONS EFFECTS MODELS. Monitor C - M2A3 BRADLEY SUPPORTING THE ASSAULT ELEMENT - LIVE SIMULATION FROM ARMY RESEARCH LAB, WASHINGTON, DC

60. PRESENTER (14:05-14:21): **Covered by an overwatching Bradley**, A squad from the same platoon begins to clear another building. They emplace and detonate an explosive charges to gain entrance to the building.

61. PRESENTER (14:22-14:39)

After the platoon leader uses his command and control system to shift fires, the **overwatching Bradleys pass through craters created by artillery fire** enroute to rejoin the dismounted squad.

TRANSITION FROM ACTION TO

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VIGNETTE 2 SUMMARY.

Videotape clips from Vignette 2:

1 Planning process**2** Vignette summary graphic (supered over video).

Information Technology:

-- increases accuracy of planning and chance of success.

-- execute faster than enemy can react.

-- execute more efficiently because of dominant real time situational awareness

3 Videotape or datalog of portions of the DBBL action.Monitor **A, B, C** Videotape clips from Vignette 2.

62. PRESENTER (14:40-14:56): These new technologies allow the brigade to plan and rehearse more accurately, and more thoroughly in training and combat, using simulation linked TOCs ...and to execute faster than the enemy can react. They allow soldiers to do their jobs more safely...and efficiently.

TRANSITION TO VIGNETTE 3, ALL SCREENS AND MONITORS FADE TO BLANK**1,2,3** and monitor **A, B, C** same as script # 62

63. PRESENTER (14:57-15:03): Now, let's switch gears and look at additional ways we can use these technologies.

INTRODUCTION TO NEW TECHNOLOGIES FOR EXPERIMENTATION.See script item # 52 for feed descriptions except **1** and **3** reversed**1** Virtual view close-up of the UD Bradley fighting vehicle.**2,3** Virtual view of advancing mechanized team with attachments. (SGI)Monitors **A, B, C** blank screen

64. PRESENTER (15:04-15:16): Combat and materiel developers will use Information Age technology to test new vehicle and equipment concepts even before they're built -- like the Bradley fighting vehicle with the different turret I pointed out earlier.

1,2,3 Monitor **A, B, C** Same as script # 64

65. PRESENTER (15:17-15:24): An engineer working on a new design for an improved version of today's Bradley fighting vehicle will discuss the use of simulations in materiel design. Welcome **San Jose**.

1 Live video VTC of UD engineer**2,3** Same as script # 64.Monitor **A** - Graphic Chart -**COMBAT SIMULATION AND INTEGRATION LAB,**

66. ENGINEER (15:25-15:37): I am **Mr. _____**, I am going to introduce you to two of the acquisition streamlining processes that we have implemented here at the Combat

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SAN JOSE, CA;Monitor **B, C** - blank screen

Simulation and Integration Lab at United Defense.

1 same as script # 66.**2** Video sequence of progressively more complex electronic diagrams. As each diagram leaves **2** it moves to Monitors **A, B, C** in order**3** Video of rotating 3-D master modelMonitor **A** - Video of first diagram on **2**,Monitor **B** - blank screen until video of second diagram on **2**, Monitor **C** - blank screen untilvideo of third diagram on **2**

67. ENGINEER (15:38-15:58): The first is our concurrent art to part environment. Our product and product structures are developed and represented as a 3-D computer master model. This model is the basis for integration of the systems and processes used for computer-aided design, computer aided manufacturing, technical publications, and product data management.

1 same as script # 66**2,3** Video of the Combat and Simulation LaboratoryMonitor **A** - Graphic Chart -MR. HOUGARTY, SAN JOSE, CA;Monitor **B** - blank screen, Monitor **C** Graphic chart - COMBAT SIMULATION AND INTEGRATION LAB

68. ENGINEER (15:59-16:11): The second process was developed here in our Combat Simulation and Integration Lab and is currently being used for the Bradley A3 project. We call this process Simulate-Emulate-Stimulate.

1 same as script # 66.**2** Video of computer with screens to be highlighted in the next storyboard**3** Slow montage of M2A3 subsystemsMonitor **A** - same as script # 68.Monitor **B** - graphic chart - M2A3 SIMULATION; Monitor **C** - M2A3 BRADLEY SUBSYSTEMS

69. ENGINEER (16:12-16:24): Our lab and our subcontractors use common computer tools to generate models of their hardware and software systems. Each subsystem's basic functionality is tested within a computer like this one. This is the simulation phase.

1 same as script # 66**2** Video sequence of progressively more complex electronic diagrams. As each diagram leaves **2** it moves to Monitors **A, B, C** in order**3** Video of M2A3 turret on the test stand annotated LAB M2A3 BRADLEY TURRETMonitor **A** - video of first diagram on **2**,Monitor **B** - blank screen until video of second diagram on **2**, Monitor **C** - blank screen until video of third diagram on **2**

70. ENGINEER (16:25-16:47): The screens you see illustrate the engineering interface to this tool. The turret drive unit is highlighted. This process is iterative and spawns the next step of the process, the emulation phase. In this phase the models are further refined and decomposed to emulate all the subsystem characteristics at the Line Replaceable Unit level.

1 same as script # 66**2,3** Same as script # 70Monitor **A, B, C** - Same as script # 70

71. ENGINEER (16:48-17:00): Within these two phases, all of the conceptual designs and interfaces have been modeled. Many design updates and improvements can be made within these cycles faster and cheaper than earlier design-build-test-redesign cycles.

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- 1 same as script # 66
- 2 Video of gunner's hand station in lab being moved right
- 3 Video of turret moving in conjunction with gunner's hand station in simulation
- Monitor A - Graphic Chart -MR. HOUGARTY, SAN JOSE, CA;
- Monitor B - Graphic Chart - M2A3 BRADLEY GUNNER'S HAND STATION SUBSYSTEM; Monitor C - Graphic chart - M2A3 BRADLEY TURRET IN SIMULATION

- 1 Live video VTC OTS of soldier rotating the gunner's hand station that will transition into the turret rotation on the test stand
- 2,3 Virtual view of M2A3 turret turning in response to the soldier's actions on 1
- Monitor A - Graphic Chart - STIMULATION PHASE, LIVE FROM SAN JOSE, CA;
- Monitor B - graphic chart - M2A3 BRADLEY IN SIMULATION, Monitor C - graphic chart - VIRTUAL M2A3 BRADLEY

INTRODUCTION TO NEW TECHNOLOGIES FOR LOGISTICS.

- 1 Video view of LAD set-up
- 2 Video of monitor feed showing automatic consumption screen
- 3 Video view of LAD set-up
- Monitor A - BLANK SCREEN
- Monitor B - Graphic chart - LOGISTICS ANCHOR DESK
- Monitor C - BLANK SCREEN

1-3 and Monitors A, B, C same as script # 74

TRANSITION FROM ACTION TO VIGNETTE 3 SUMMARY

72. ENGINEER (17:01-17:18): Actual vehicle hardware is driven by these computer models in the final phase, the stimulation phase. In this phase, the soldier can be introduced into the design and evaluation process, providing hands-on feedback in specific tasks or in virtual combat situations.

73. ENGINEER (17:19-17:31): As an example, a soldier inputs a turret movement command, our test stand unit slews under his direction, and your virtual world simulation sees his vehicle input simultaneously.

74. PRESENTER (17:32-17:54): Information Age technology will also help logisticians. It will give them new tools so they can support our troops more quickly and efficiently in the field: Using built-in logistics monitors, they'll continuously receive ammunition, fuel consumption, and maintenance information, in real time, throughout the battle. So, they can redistribute resources constantly.

75. PRESENTER (17:55-18:07): These computerized analytical tools will give commanders more flexibility, the opportunity to anticipate conditions, and the chance to execute continuous operations for longer periods of time.

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1,2,3 and Monitor **A, B, C** Videotape clips edited into a montage from all three vignettes w/supered graphics

- Battle.
- Training.
- Equipment development.
- Logistics
- Speed
- Accuracy

Monitor **A, B, C** - Videotape clips edited into a montage from all three vignettes

76. PRESENTER (18:08-18:16): Information Age technology is rich with potential to improve our Army's training, equipment development, logistics, and warfighting capabilities.

1,2,3 and Monitor **A, B, C** same as script # 76

77. PRESENTER (18:17-18:29): It holds the power to let commanders visualize and control the battlefield and to communicate better and faster than ever before.

TRANSITION FROM VIGNETTE 3 TO CONCLUSION.

1-3 and monitor **A, B, C** same as script #1

78. PRESENTER (18:30-18:57): As we explore the technologies of tomorrow, we must remember that America's Army is the best fighting force in the world today because of the foresight of yesterday's leaders. They developed the warfighting concepts that have led to the outstanding equipment, training programs, and doctrine we now rely on. Our challenge is to be just as farsighted for the soldiers of tomorrow...

Video clips with graphic supers:

1-3. same as script # 1 with below annotated one per screen

- Where am I?
- Where are my friends?
- Where is the enemy?

Monitors **A, B, C** blank screen

79. PRESENTER (18:58-19:12): ...so we can be sure that in the 21st century, America's warriors will know where they are, where their friends are, and where the enemy is, giving them real time dominant situational awareness.

TRANSITION FROM MAIN PROGRAM TO POST SHOW

1,2,3 and **A, B, C** Post show same as pre-show

80. PRESENTER (19:13-19:28): Thank you for coming to our Warriors in the Information Age experiment. It's been a pleasure talking with you. Don't forget to pick up your CD. **Please follow me to the 21st Century TOC.**

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APPENDIX D - IMMERSIVE THEATER SCRIPT

MC Reading Script- 2 Oct Copy

1. **5 sec-PRESENTER (0:00-0:05):** Good morning/afternoon. I'm _____. Welcome to the Army's Warriors in the Information Age presentation.
2. **16 sec-PRESENTER (0:06-0:22):** We're here to show you America's Army applying Information Age technology -now -to prepare for the 21st Century battlefield. Our soldiers are training with these new technologies -- including simulations -- And over the next twenty minutes, you'll see them in action -- much of it, live.
3. **11 sec-PRESENTER (0:23-0:34):** This is a live **distributed** show where anything can happen so we'll have a good time!
4. **23 sec-PRESENTER (0:35-0:58):** Much of what you'll see here will be new, and you may have some questions. We can't stop our live show while it's running, but we will have time for questions a little later. And you can learn more about these technologies as you move next door to the 21st Century TOC, and from the hands-on equipment here in the ballroom -- as well as from the CD-ROM you'll receive when you leave here today.
5. **27 sec-PRESENTER (0:59-1:26):** Now, let's talk about the connectivity of this special experiment! Here in the theater, you'll be seeing four live video feeds and seven live simulation feeds, coming from eight remote sites. Participants at the sites will communicate with multiple simulations over experimental networks, and interact in real time. Most will be linked on the same simulated battlefield, although they're up to a thousand miles apart. In the future, this will be routine, instead of a special experiment.
6. **10 sec-PRESENTER (1:27-1:37):** The vignettes you're about to see take place in the 21st Century -- only four years away. By then, some of those officers you saw outside could be battalion or higher level commanders.
7. **28 sec-PRESENTER (1:38-2:06):** They'll train and fight using information and simulation systems designed to compress planning and decision making cycles. Information technology will give them real time dominant situational awareness of the battlefield... and the ability to plan and act faster than our enemies can react. These technologies will also aid logisticians in managing the needs of a force projection Army... and future combat and materiel developers in testing new equipment, before it's ever built.
8. **10 sec-PRESENTER (2:07-2:17):** We're exploiting these technologies to give our soldiers the best tools possible -- so they can survive and win on the battlefield of the next century.

9. **12 sec-PRESENTER (2:18-2:30):** While no technology can make our soldiers invincible... these new tools can make them more efficient and effective...so we can continue to overmatch our adversaries and be better able to respond to our nation's needs.
10. **8 sec-PRESENTER (2:31-2:39):** But before we enter the future, let's set a historical perspective. Since ancient times, all ground commanders have grappled with the same three questions:
11. **5 sec-PRESENTER (2:40-2:45):** Where am I? Where are my friends? And where is the enemy?
12. **28 sec-PRESENTER (2:46-3:14):** The commander who can best answer these questions in the shortest time has dominant situational awareness. That commander knows where his or her units are, where friendly units are and where the enemy is...and he can plan and act faster than the enemy can react, resulting in victory. Throughout history, the commander's ability to answer those three questions and gain dominant situational awareness has varied with the size, lethality and speed of the battlefield.
13. NOT USED.
14. NOT USED.
15. NOT USED.
16. **21 sec-PRESENTER (3:15-3:36):** In the past hundred years, the size, lethality, and speed of the battlefield have expanded exponentially. The ability to gather battlefield information has kept up with that expansion -- but the sheer amount of data is often overwhelming. The challenge today and in the future is how to fuse or distill that data into usable information -- faster than the enemy can.
17. **21 sec-PRESENTER (3:37-3:58):** By capitalizing on information technology, the Army is gaining that capability. Our 21st Century commanders will see more of the battlefield and communicate faster -- but most importantly, they'll use the data they gather more effectively... giving them REAL TIME dominant situational awareness to plan and execute faster than the enemy can react.
18. **21 sec-PRESENTER (3:59-4:20):** Our 21st Century commanders will visualize the battlefield on electronic operations maps updated continuously with key data. They will know where they are, where their friends are and where the enemy is. They will be able to compress their planning and decision cycles, utilizing more accurate information.
19. **19 sec-PRESENTER (4:21-4:40):** In our first vignette, you'll see how these technologies help the corps commander compress planning and decision cycles in order to attack multiple targets at multiple locations nearly simultaneously in a deep battle_situation. We will condense the duration of the battle from hours to minutes, for the sake of time.

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20. **30 sec-PRESENTER** (4:41-5:11): To detect and accurately portray a major enemy attack, the Corps depends on intelligence collection systems, such as the joint Army /Air Force JSTARS aircraft. These systems collect and downlink huge quantities of **organized** intelligence data to Common Ground Stations. Then, skilled operators use sophisticated analysis technologies, such as the All Source Analysis System, to select, distill, and display the key information from that vast collection of data.
21. **10 sec-PRESENTER** (5:12-5:22): The corps commander uses this information to monitor and predict the enemy's actions and to plan the attack throughout the depth of the enemy's sector.
22. NOT USED.
23. **19 sec-PRESENTER** (5:23-5:42): The commander's first move is to detect and engage high priority targets deep behind the enemy's line. An unmanned aerial vehicle, or UAV, concentrates on the area indicated as critical by the JSTARS intelligence. This helps the corps to determine the thrust of the main attack, and to look for high value targets.
24. **9 sec-PRESENTER** (5:43-5:52): Meanwhile, national reconnaissance assets observe an enemy SCUD launch and transmit the information to the corps.
25. **10 sec-PRESENTER** (5:53-6:03): Corps missile defense units receive the launch information, acquire the enemy missile, launch and destroy it.
26. **11 sec-PRESENTER** (6:04-6:15): The corps diverts a Comanche team on a deep reconnaissance mission to find and destroy the enemy **SCUD launcher**. The Comanches turn and begin to search for the **SCUD launcher**.
27. **10 sec-PRESENTER** (6:16-6:26): Within minutes, the Comanches locate it, near a forward operating base with the critical missile reload trucks.
28. **13 sec-PRESENTER** (6:27-6:40): The Comanche team leader sends a digital call for fire message directly to the supporting ATACMS unit to destroy the forward operating base.
29. **8 sec-PRESENTER** (6:41-6:49): The corps has cleared the target, and the ATACMS firing unit launches.
30. **15 sec-PRESENTER** (6:50-7:05): It would take the missile three to five minutes to reach the target. We will only show you a part of the flight and the impact. (Sound of missile impact).
31. NOT USED
32. **15 sec-PRESENTER** (7:06-7:21): The ATACMs missile destroys most of the Forward Operating Base. The Comanche team conducts a target damage assessment, detects a second **SCUD launcher** and rapidly destroys it.

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33. **18 sec-PRESENTER** (7:22-7:40): While the Comanches complete their attack, another sensor is at work -- a Special Forces reconnaissance team. The team uses thermal sights to detect targets through smoke and obscurants along an enemy route. They burst-transmit the information to their headquarters.
34. **10 sec-PRESENTER** (7:41-7:51): The Corps wants to attack the rocket systems as part of their counter fire efforts. So, it diverts Marine strike aircraft under Air Force counter-air **patrol** to do the job.
35. **8 sec-PRESENTER** (7:52-8:00): The Marine strike aircraft attack the enemy rocket site, while the reconnaissance team assesses damage.
36. **8 sec-PRESENTER** (8:01-8:09): As the enemy rocket launchers burn, the Corps commander prepares to attack an enemy armor threat.
37. **7 sec-PRESENTER** (8:10-8:17): The UAV sensors confirm the target. The commander rechecks the intelligence picture to confirm attack timing. It looks good.
38. **9 sec-PRESENTER** (8:18-8:27): The commander directs the Aviation Brigade to execute the attack helicopter battalion's plan. They will attack the armored column.
39. **14 sec-PRESENTER** (8:28-8:42): Comanches destroy enemy air defense systems. The AH-64D Longbow Apaches coordinate targeting data digitally and engage the armored column at maximum targeting range.
40. **10 sec-PRESENTER** (8:43-8:53): After the engagement, the Corps receives reports of enemy destruction from the Comanche and UAV.
41. **21 sec-PRESENTER** (8:54-9:15). So, that's what elements of a corps level battle might look like in the 21st Century. It'll be a fast, lethal, complex fight, that takes place over thousands of square miles of terrain. Our Corps commander used real time dominant situational awareness to act faster than the enemy could react by engaging and destroying multiple high priority targets at multiple locations nearly simultaneously.
42. **7 sec-PRESENTER** (9:16-9:23): When you visit the 21st Century TOC next, you can see some of the actual equipment we talked about in this operation.
43. **14 sec-PRESENTER**: (9:24-9:38) **The Army will learn more about dominant situational awareness during a brigade-level Advanced Warfighting Experiment at the National Training Center. There is more information in your CD.**
44. **6 sec-PRESENTER** (9:39-9:45): Let's move on now from the deep battle to the close battle, from the corps to a combat maneuver brigade.

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- 45. 21 sec-PRESENTER (9:46-10:07):** In this vignette, we'll focus again on situational awareness, planning and dissemination of orders among TOCs linked by simulations. Here again, information technology will dramatically improve our speed and accuracy in training and combat. It will help make our soldiers virtual combat veterans, before they engage the enemy in actual combat.
- 46. 15 sec-PRESENTER (10:08-10:23):** As we join the brigade commander, battle is imminent. He sends a detailed warning order to his commanders and their TOCs to prepare them for a possible counterattack. His message appears almost instantly as a graphic on their computer screens.
- 47. 11 sec-PRESENTER: (10:24-10:33)** Immediately, commanders and staffs at two levels share the same information. They're ready to conduct simultaneous planning using simulations.
- 48. 14 sec-PRESENTER (10:34-10:48):** While the subordinate commanders study the warning order, the brigade commander uses automated planning tools to analyze various courses of action. He and his staff wargame the counterattack courses of action using a simulation.
- 49. 16 sec-PRESENTER (10:49-11:05):** Next, he electronically rehearses it with the battalion commanders -- again using a simulation-- so they can see and hear how the commander expects the battle to unfold, and coordinate critical points.
- 50. 16 sec-PRESENTER (11:06-11:22):** When he's satisfied, the brigade commander electronically disseminates the final order with any changes discovered during the rehearsal. This ability to plan and rehearse simultaneously between command levels drastically reduces planning cycles.
- 51. 15 sec-PRESENTER (11:23-11:38):** An hour later, a scout detects enemy armor moving toward a key village. This could trigger the counterattack. The commander confirms the threat through his intelligence feeds. He directs the brigade to execute the counterattack they just rehearsed.
- 52. 10 sec-PRESENTER (11:39-11:49):** The plan calls for a mechanized task force to seize the village and block the enemy's advance. Lead elements of the task force conduct an in-stride breach, with engineer assistance, as they move toward the village.
- 53. 9 sec-PRESENTER (11:50-11:59):** I want to bring your attention to this M2A3 Bradley fighting vehicle with a different turret -- we'll talk more about it later.
- 54. 31 sec-PRESENTER (12:00-12:31):** The infantry dismounts to clear the village and begins to receive sniper fire. The soldier you see live from Fort Benning is using virtual simulation and head-mounted automated command and control equipment. He is the first soldier in the column, here in the simulation. (PRESENTER points to the mobility platform soldier's image on the virtual view). Throughout this portion of the battle you will see a live battlespace

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overview on this monitor (PRESENTER points to Monitor A) and various views of the soldiers' command and control systems on this monitor. (PRESENTER points to Monitor B) These include messages, calls for fire, and **map displays**.

- 55. 23 sec-PRESENTER (12:32-12:55):** The platoon leader's automated command and control system provides him with real time dominant situational awareness. He uses it to direct his units to destroy known enemy. This capability enhances the efficiency and lethality of his platoon, and reduces the probability of fratricide. Using similar information systems, fire team and squad leaders keep their commanders apprised of the situation.
- 56. 16 sec-PRESENTER (12:56-13:12):** The platoon leader receives a SITREP from his commander indicating an enemy armored column approaching the village. Using his control system, he can constantly monitor his units, friendly units, and known enemy units. He can automatically update his subordinates with graphics, unit locations and orders.
- 57. 8 sec-PRESENTER (13:13-13:21):** As the assault continues, he executes a call for indirect fire on his command and control device to block the enemy armor column until the platoon clears the village.
- 58. 24 sec-PRESENTER (13:22-13:46):** After the supporting fires are lifted, the assault element enters the building. **By scanning the room using his rifle view from a protected position, the fire team leader locates and kills the sniper.** The platoon leader now updates the platoon using his command and control headset.
- 59. 17 sec-PRESENTER (13:47-14:04):** The fire team leader observes .the artillery fire on the approaching enemy armor. **Placing his weapon reticle on the target and activating his laser rangefinder, he automatically sends the firing battery and his chain of command fire adjustments.**
- 60. 16 sec-PRESENTER (14:05-14:21):** **Covered by an overwatching Bradley,** a squad from the same platoon begins to clear another building. They emplace and detonate an explosive charges to gain entrance to the building.
- 61. 17 sec-PRESENTER (14:22-14:39):** After the platoon leader uses his command and control system to shift fires, the **overwatching Bradleys pass through craters created by artillery fire** enroute to rejoin the dismounted squad.
- 62. 16 sec-PRESENTER (14:40-14:56):** These new technologies allow the brigade to plan and rehearse more accurately, and more thoroughly in training and combat, using simulation linked TOCs ...and to execute faster than the enemy can react. They allow soldiers to do their jobs more safely...and efficiently.
- 63. 6 sec-PRESENTER (14:57-15:03):** Now, let's switch gears and look at additional ways we can use these technologies.

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64. **12 sec-PRESENTER (15:04-15:16):** Combat and materiel developers will use Information Age technology to test new vehicle and equipment concepts even before they're built -- like the Bradley fighting vehicle with the different turret I pointed out earlier.
65. **7 sec-PRESENTER (15:17-15:24):** An engineer working on a new design for an improved version of today's Bradley fighting vehicle will discuss the use of simulations in materiel design. Welcome **San Jose**.
66. **12 sec-ENGINEER (15:25-15:37):** I am Mr. _____ I am going to introduce you to two of the acquisition streamlining processes that we have implemented here at the Combat Simulation and Integration Lab at United Defense.
67. **20 sec-ENGINEER (15:38-15:58):** The first is our concurrent art to part environment. Our product and product structures are developed and represented as a 3-D computer master model. This model is the basis for integration of the systems and processes used for computer-aided design, computer aided manufacturing, technical publications, and product data management.
68. **12 sec-ENGINEER (15:59-16:11):** The second process was developed here in our Combat Simulation and Integration Lab and is currently being used for the Bradley A3 project. We call this process Simulate-Emulate-Stimulate.
69. **12 sec-ENGINEER (16:12-16:24):** Our lab and our subcontractors use common computer tools to generate models of their hardware and software systems. Each subsystem's basic functionality is tested within a computer like this one. This is the simulation phase.
70. **22 sec-ENGINEER (16:25-16:47):** The screens you see illustrate the engineering interface to this tool. The turret drive unit is highlighted. This process is iterative and spawns the next step of the process, the emulation phase. In this phase the models are further refined and decomposed to emulate all the subsystem characteristics at the Line Replaceable Unit level.
71. **12 sec-ENGINEER (16:48-17:00):** Within these two phases, all of the conceptual designs and interfaces have been modeled. Many design updates and improvements can be made within these cycles faster and cheaper than earlier design-build-test-redesign cycles.
72. **17 sec-ENGINEER (17:01-17:18):** Actual vehicle hardware is driven by these computer models in the final phase, the stimulation phase. In this phase, the soldier can be introduced into the design and evaluation process, providing hands-on feedback in specific tasks or in virtual combat situations.
73. **12 sec-ENGINEER (17:19-17:31):** As an example, a soldier inputs a turret movement command, our test stand unit slews under his direction, and your virtual world simulation sees his vehicle input simultaneously.
74. **22 sec-PRESENTER (17:32-17:54):** Information Age technology will also help logisticians. It will give them new tools so they can support our troops more quickly and efficiently in the

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field: Using built-in logistics monitors, they'll continuously receive ammunition, fuel consumption, and maintenance information, in real time, throughout the battle. So, they can redistribute resources constantly.

- 75. 12 sec-PRESENTER (17:55-18:07):** These computerized analytical tools will give commanders more flexibility, the opportunity to anticipate conditions, and the chance to execute continuous operations for longer periods of time.
- 76. 8 sec-PRESENTER (18:08-18:16):** Information Age technology is rich with potential to improve our Army's training, equipment development, logistics, and warfighting capabilities.
- 77. 12 sec-PRESENTER (18:17-18:29):** It holds the power to let commanders visualize and control the battlefield and to communicate better and faster than ever before.
- 78. 27 sec-PRESENTER (18:30-18:57):** As we explore the technologies of tomorrow, we must remember that America's Army is the best fighting force in the world today because of the foresight of yesterday's leaders. They developed the warfighting concepts that have led to the outstanding equipment, training programs, and doctrine we now rely on. Our challenge is to be just as farsighted for the soldiers of tomorrow.
- 79. 14 sec-PRESENTER (18:58-19:12):** ...so we can be sure that in the 21st century, America's warriors will know where they are, where their friends are, and where the enemy is, giving them real time dominant situational awareness.
- 80. 15 sec-PRESENTER (19:13-19:28):** Again, thank you for coming to our Warriors in the Information Age experiment. It's been a pleasure talking with you. Don't forget to pick up your CD. **Please follow me to the 21st Century TOC.**

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APPENDIX E - COTILLION BALLROOM POWER

| ZONE K - Immersive Theater Computer Room | | | | | |
|--|--------------------------|------------|------------|---------|-------------------|
| Equipment Name | Equipment Type | Minor Item | Power Req. | | Power Outlet Type |
| | | | 110 (A) | 220 (A) | |
| IDREN Router | Cisco 4000 | -A- | | | Quad Plug |
| CSU/DSU | | -A- | | | Quad Plug |
| Stealth IG # 1 | SGI RE3 (3) channel | -A- | | 30 | 3 phase |
| Stealth IG # 2 | SGI RE3 (3) channel | -A- | | 30 | 3 phase |
| Stealth IG # 3 | SGI RE3 (3) channel | -A- | | 30 | 3 phase |
| Stealth IG # 4 | SGI RE3 (3) channel | -A- | | 30 | 3 phase |
| Additional Cooling | | -A- | | | |
| Sound Storm | PC CPU | -A- | 5 | | Quad Plug |
| Sound Storm | PC Display | -B- | 2 | | Quad Plug |
| MCS/P | Ultra Sparc CPU | -A- | 5 | | Quad Plug |
| MCS/P | Ultra Sparc Display | -B- | 2 | | Quad Plug |
| ASAS | Sun Sparc 20 CPU | -A- | 5 | | Quad Plug |
| ASAS | Sun Sparc 20 Display | -B- | 2 | | Quad Plug |
| BPV | SGI Solid Impact CPU | -A- | 5 | | Quad Plug |
| BPV | SGI Solid Impact Display | -B- | 2 | | Quad Plug |
| LWSE | Sun Sparc 20 CPU | -A- | 5 | | Quad Plug |
| LWSE | Sun Sparc 20 Display | -B- | 2 | | Quad Plug |
| ModSAF #1 Front End CPU | SGI CPU | -A- | 5 | | Quad Plug |
| ModSAF #1 Front End Display | SGI Display | -B- | 2 | | Quad Plug |
| ModSAF #1 Back End CPU | SGI CPU | -A- | 5 | | Quad Plug |
| ModSAF #1 Back End Display | SGI Display | -B- | 2 | | Quad Plug |
| ModSAF #2 Front End CPU | SGI CPU | -A- | 5 | | Quad Plug |
| ModSAF #2 Front End Display | SGI Display | -B- | 2 | | Quad Plug |
| ModSAF #2 Back End CPU | SGI CPU | -A- | 5 | | Quad Plug |
| ModSAF #2 Back End Display | SGI Display | -B- | 2 | | Quad Plug |
| Data Logger CPU | SGI CPU | -A- | 5 | | Quad Plug |
| Data Logger Display | SGI Display | -B- | 2 | | Quad Plug |
| M-Bone CPU | SGI CPU | -A- | 5 | | Quad Plug |
| M-Bone Display | SGI Display | -B- | 2 | | Quad Plug |
| Cordless Phone #1 | | -A- | 1 | | Quad Plug |

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| | | | | | |
|-------------------------------|------------------------|------------|------------|---------|-------------------|
| Cordless Phone #2 | | -A- | 1 | | Quad Plug |
| Cordless Phone #3 | | -A- | 1 | | Quad Plug |
| Handheld Radio | Motorola | -A- | 1.5 | | Quad Plug |
| Battery Charger | | | | | |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| IT Computer Room | | | 121.5 | 120 | |
| Power Totals | | | | | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE C - FP TOC Computer Room | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| UAV TCSS Driver #1 | PC CPU | -A- | 4 | | Quad Plug |
| UAV TCSS Driver #1 | PC Display | -B- | 1.2 | | Quad Plug |
| UAV TCSS Driver #1 | RS422 Converter | -C- | 1 | | Quad Plug |
| UAV TCSS Driver #2 | PC CPU | -A- | 4 | | Quad Plug |
| UAV TCSS Driver #2 | PC Display | -B- | 1.2 | | Quad Plug |
| UAV TCSS Driver #2 | RS422 Converter | -C- | 1 | | Quad Plug |
| UAV TCSS Driver #3 | PC CPU | -A- | 4 | | Quad Plug |
| UAV TCSS Driver #3 | PC Display | -B- | 1.2 | | Quad Plug |
| UAV TCSS Driver #3 | RS422 Converter | -C- | 1 | | Quad Plug |
| UAV TCSS Driver #4 | PC CPU | -A- | 4 | | Quad Plug |
| UAV TCSS Driver #4 | PC Display | -B- | 1.2 | | Quad Plug |
| UAV TCSS Driver #4 | RS422 Converter | -C- | 1 | | Quad Plug |
| UAV Scene Generator #1 | Hyper Converter | -A- | 2 | | Quad Plug |
| UAV Scene Generator #1 | Video Distribution Amp | -B- | 1 | | Quad Plug |
| UAV Scene Generator #1 | SGI Monitor | -C- | 3 | | Quad Plug |
| UAV Scene Generator #1 | Onyx | -D- | | 13 | |
| UAV Scene Generator #2 | Hyper Converter #1 | -A- | 2 | | Quad Plug |

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| | | | | | |
|---------------------------|------------------------|-----|----|----|-----------|
| UAV Scene Generator #2 | Hyper Converter #2 | -B- | 2 | | Quad Plug |
| UAV Scene Generator #2 | Hyper Converter #3 | -C- | 2 | | Quad Plug |
| UAV Scene Generator #2 | Video Distribution Amp | -D- | 1 | | Quad Plug |
| UAV Scene Generator #2 | SGI Monitor | -E- | 3 | | Quad Plug |
| UAV Scene Generator #2 | Onyx | -F- | | 13 | |
| FP TOC Stealth | SGI CPU | -A- | 16 | | Quad Plug |
| FP TOC Stealth | SGI Display | -B- | 0 | | Quad Plug |
| FP TOC PVD/C | PC CPU | -A- | 5 | | Quad Plug |
| FP TOC PVD/C | PC Display | -B- | 0 | | Quad Plug |
| FP TOC DRP | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC DRP | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC SEN/C2I | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC SEN/C2I | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC Stat Display | SGI CPU | -A- | 5 | | Quad Plug |
| FP TOC Stat Display | SGI Display | -B- | 0 | | Quad Plug |
| FP TOC AAR Stat | PC CPU | -A- | 5 | | Quad Plug |
| FP TOC AAR Stat | PC Display | -B- | 0 | | Quad Plug |
| FP TOC EADSIM | SGI CPU | A | 5 | | Quad Plug |
| FP TOC EADSIM | SGI Display | -B- | 0 | | Quad Plug |
| FP TOC DIS DL | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC DIS DL | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC TCSS Driver #1 | PC CPU | -A- | 5 | | Quad Plug |
| FP TOC TCSS Driver #1 | PC Display | -B- | 0 | | Quad Plug |
| FP TOC Scene Generator #1 | SGI | -A- | | 16 | |
| FP TOC Scene Generator #1 | SGI | -B- | 5 | | Quad Plug |
| FP TOC Misc | Misc | -A- | 20 | | Quad Plug |
| Additional Cooling | | -A- | | | |
| FP TOC PVD | SGI CPU | -A- | 5 | | Quad Plug |
| FP TOC PVD | SGI Display | -B- | 0 | | Quad Plug |
| FP TOC UAV-GS | Sun CPU | -A- | 10 | | Quad Plug |
| FP TOC UAV-GS | Sun Display | -B- | 0 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |

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| | | | | | |
|-----------------------------------|-----------------------------|------------|------------|---------|-------------------|
| Spare | | -A- | 5 | | Quad Plug |
| | | | | | |
| FP TOC Computer Room Power Totals | | | 176.8 | 42 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE T - Tech Control | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| FP TOC Misc. | | -A- | | | Quad Plug |
| FP TOC Misc. | | -A- | | | Quad Plug |
| FP TOC Misc. | | -A- | | | Quad Plug |
| FP TOC Misc. | | -A- | | | Quad Plug |
| Image Tech | FP TOC Video Switch | -A- | 5 | | Quad Plug |
| Image Tech | FP TOC Lighting Control (?) | -A- | 5 | | Quad Plug |
| Image Tech | FP TOC Audio Control | -A- | 5 | | Quad Plug |
| Image Tech | | -A- | 5 | | Quad Plug |
| Image Tech | VTC #1 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #1 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #1 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #1 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #2 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #2 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #2 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #2 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #3 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #3 | -B- | 5 | | Quad Plug |
| Image Tech | VTC #3 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #3 | -B- | 5 | | Quad Plug |
| Image Tech | VTC #4 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #4 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #4 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #4 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #5 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #5 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #5 | -A- | 5 | | Quad Plug |
| Image Tech | VTC #5 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #1 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #1 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #1 | -A- | 5 | | Quad Plug |

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| | | | | | |
|---------------------------|---------------------|------------|------------|---------|-------------------|
| Image Tech | Electronics Rack #1 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #2 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #2 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #2 | -A- | 5 | | Quad Plug |
| Image Tech | Electronics Rack #2 | -A- | 5 | | Quad Plug |
| Image Tech | | -A- | 100 | | |
| Image Tech | Spot Light PDP | -A- | | 100 | |
| Exhibit Crafts | A/C UNIT | -A- | | 30 | pigtail |
| Exhibit Crafts | A/C UNIT | -A- | | 30 | pigtail |
| Exhibit Crafts | A/C UNIT | -A- | | 30 | pigtail |
| Exhibit Crafts | Outside A/C UNIT | -A- | | 30 | pigtail |
| Exhibit Crafts | Outside A/C UNIT | -A- | | 30 | pigtail |
| Spare | Electronics Rack #3 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #3 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #3 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #3 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #4 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #4 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #4 | -A- | 5 | | Quad Plug |
| Spare | Electronics Rack #4 | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Tech Control Power Totals | | | 340 | 250 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE P - Projection Room | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| Image Tech | Large Projector #1 | -A- | 5 | | Quad Plug |
| Image Tech | Small Projector #1 | -A- | 5 | | Quad Plug |
| Image Tech | Large Projector #2 | -A- | 5 | | Quad Plug |
| Image Tech | Small Projector #2 | -A- | 5 | | Quad Plug |
| Image Tech | Large Projector #3 | -A- | 5 | | Quad Plug |
| Image Tech | Small Projector #3 | -A- | 5 | | Quad Plug |
| Image Tech | Stealth #1 CPU | -A- | 5 | | Quad Plug |

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| | | | | | |
|-------------------------|----------------|------------|------------|---------|-------------------|
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Projection Room | | | 320 | 0 | |
| Power Totals | | | | | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE F - FP TOC Theater | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| FP TOC ASAS/W | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC ASAS/W | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC AFATDS | HP CPU | -A- | 5 | | Quad Plug |
| FP TOC AFATDS | HP Display | -B- | 0 | | Quad Plug |
| FP TOC MCS/P | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC MCS/P | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC ADSI | PC CPU | -A- | 5 | | Quad Plug |
| FP TOC ADSI | PC Display | -B- | 0 | | Quad Plug |
| FP TOC FAAD | HP CPU | -A- | 5 | | Quad Plug |
| FP TOC FAAD | HP Display | -B- | 0 | | Quad Plug |
| FP TOC GALE | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC GALE | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC MSTs | SGI CPU | -A- | 5 | | Quad Plug |
| FP TOC MSTs | SGI Display | -B- | 0 | | Quad Plug |
| FP TOC DAMS | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC DAMS | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC CRTD | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC CRTD | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC LAD | Sun CPU | -A- | 5 | | Quad Plug |
| FP TOC LAD | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC Serial Hub | | -A- | 5 | | Quad Plug |
| FP TOC Display #1 | | -A- | | | Quad Plug |
| FP TOC Display #2 | | -A- | | | Quad Plug |
| FP TOC TSIU | Sun CPU | -A- | 5 | | Quad Plug |

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| | | | | | |
|-------------------------------|------------------|------------|------------|---------|-------------------|
| FP TOC TSIU | Sun Display | -B- | 0 | | Quad Plug |
| FP TOC PIU | PC CPU | -A- | 5 | | Quad Plug |
| FP TOC PIU | PC Display | -B- | 0 | | Quad Plug |
| FP TOC Misc. | | -A- | 5 | | Quad Plug |
| UAV TCSS #1 | Sun Monitor | -A- | 5 | | Quad Plug |
| UAV TCSS #1 | Sparc 20 CPU | -A- | 5 | | Quad Plug |
| UAV TCSS #1 | Joystick | -A- | 5 | | Quad Plug |
| UAV TCSS #1 | RS-422 Converter | -A- | 5 | | Quad Plug |
| UAV TCSS #1 | Sony 9" Monitor | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Exhibit Crafts FP TOC | Ceiling Lighting | | | | |
| | | | | | |
| FP TOC Theater Power Totals | | | 130 | 0 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE Z - FP TOC TECH AREA | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Image Tech | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| | | | | | |
| FP TOC TECH AREA Power Totals | | | 240 | 0 | |
| | | | Amps | Amps | |
| | | | | | |

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| ZONE V - Virtual Maintainer Standalone Display | | | | | |
|--|------------------|------------|------------|---------|-------------------|
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| V-Mat Monitor #1 | Mitsubishi 37" | -A- | 20 | | Quad Plug |
| V-Mat Monitor #2 | Mitsubishi 37" | -A- | 20 | | Quad Plug |
| V-Mat Light Board | Light Board | -A- | 7.5 | | Quad Plug |
| V-Mat Light Board | Light Board | -B- | 7.5 | | Quad Plug |
| Zone V Quad #1 | Quad Outlet | -A- | 20 | | Quad Plug |
| Zone V Quad #2 | Quad Outlet | -A- | 20 | | Quad Plug |
| Zone V Quad #3 | Quad Outlet | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Virtual Maintainer Standalone Power Totals | | | 135 | 0 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE U - UAV Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| UAV TCSS #2 | Sun Monitor | -A- | 1.6 | | Quad Plug |
| UAV TCSS #2 | Sparc 20 CPU | -B- | 4.6 | | Quad Plug |
| UAV TCSS #2 | Joystick | -C- | 0.3 | | Quad Plug |
| UAV TCSS #2 | RS-422 Converter | -D- | 0.1 | | Quad Plug |
| UAV TCSS #2 | Sony 9" Monitor | -E- | 2 | | Quad Plug |
| UAV TCSS #3 | Sun Monitor | -A- | 1.6 | | Quad Plug |
| UAV TCSS #3 | Sparc 20 CPU | -B- | 4.6 | | Quad Plug |
| UAV TCSS #3 | Joystick | -C- | 0.3 | | Quad Plug |
| UAV TCSS #3 | RS-422 Converter | -D- | 0.1 | | Quad Plug |
| UAV TCSS #3 | Sony 9" Monitor | -E- | 2 | | Quad Plug |
| UAV TCSS #4 | Sun Monitor | -A- | 1.6 | | Quad Plug |
| UAV TCSS #4 | Sparc 20 CPU | -B- | 4.6 | | Quad Plug |
| UAV TCSS #4 | Joystick | -C- | 0.3 | | Quad Plug |
| UAV TCSS #4 | RS-422 Converter | -D- | 0.1 | | Quad Plug |
| UAV TCSS #4 | Sony 9" Monitor | -E- | 2 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |

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| | | | | | |
|---|----------------|------------|------------|---------|-------------------|
| Spare | | -A- | 20 | | Quad Plug |
| | | | | | |
| Virtual Maintainer Standalone Power Totals | | | 125.8 | 0 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE E - Virtual Retinal Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| Zone E Quad #1 | Quad Outlet | -A- | 20 | | Quad Plug |
| Zone E Quad #1 | Quad Outlet | -B- | 20 | | Quad Plug |
| Zone E Quad #1 | Quad Outlet | -C- | 20 | | Quad Plug |
| Zone E Quad #1 | Quad Outlet | -D- | 20 | | Quad Plug |
| VRD Light Board #1 | Light Board | -A- | 7.5 | | Quad Plug |
| VRD Light Board #1 | Light Board | -A- | 7.5 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| Spare | | -A- | 20 | | Quad Plug |
| | | | | | |
| Virtual Retinal Display Standalone Power Totals | | | 135 | 0 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE M - Telemedicine Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| TeleMed Light Board #1 | Light Board | -A- | 7.5 | | Quad Plug |
| TeleMed Light Board #1 | Light Board | -B- | 7.5 | | Quad Plug |
| TeleMed Light Board #2 | Light Board | -A- | 7.5 | | Quad Plug |
| TeleMed Light Board #2 | Light Board | -B- | 7.5 | | Quad Plug |
| TeleMed Light Board #3 | Light Board | -A- | 7.5 | | Quad Plug |
| TeleMed Light Board #3 | Light Board | -B- | 7.5 | | Quad Plug |

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| | | | | | |
|---|----------------|------------|------------|---------|-------------------|
| VRD Standalone | | | 85 | 60 | |
| Power Totals | | | Amps | Amps | |
| | | | | | |
| ZONE S - Scout Vehicle Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| Scout Light Board #1 | Light Board | -A- | 7.5 | | Quad Plug |
| Scout Light Board #1 | Light Board | -B- | 7.5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| | | -A- | 5 | | Quad Plug |
| | | -A- | 5 | | Quad Plug |
| | | -A- | 5 | | Quad Plug |
| | | -A- | 5 | | Quad Plug |
| Spare | | -A- | | 30 | L6-20 |
| | | | | | |
| Scout Vehicle Standalone Power Totals | | | 85 | 30 | |
| | | | Amps | Amps | |
| | | | | | |
| ZONE A - Army Enterprise Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| AE Light Board #1 | Light Board | -A- | 7.5 | | Quad Plug |
| AE Light Board #1 | Light Board | -B- | 7.5 | | Quad Plug |
| AE Light Board #2 | Light Board | -A- | 20 | | Quad Plug |
| AE Light Board #2 | Light Board | -B- | 20 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |

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| | | | | | |
|---|----------------|------------|------------|---------|-------------------|
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Army Enterprise Standalone Power Totals | | | 135 | 0 | |
| | | | Amps | Amps | |
| ZONE R - Reception Standalone Display | | | | | |
| | | | Power Req. | | |
| Equipment Name | Equipment Type | Minor Item | 110 (A) | 220 (A) | Power Outlet Type |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Spare | | -A- | 5 | | Quad Plug |
| Reception Standalone Power Totals | | | 20 | 0 | |
| | | | Amps | Amps | |
| Cotillion Totals | Ballroom | | 2210.1 | 502 | |

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APPENDIX F - MOVE-IN SCHEDULE**ADST II**

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Monday Oct 7 - Noon to Midnight

| Oct 7, Monday | MOVE IN | SET UP | INTEGRATION |
|---------------|---------------|--------|-------------|
| 1200 Hours | | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | Sheraton, MSN | | |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Tuesday Oct 8 - AM to Noon

| Oct 8, Tuesday | MOVE IN | BUILD UP | INTEGRATION |
|----------------|--|------------------------|-------------|
| 0000 Hours | | Install 10Mbit Line | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | | |
| 0800 | | | |
| 0900 | | | |
| 1000 | | | |
| 1100 | | | |
| Support → | These installations will be behind the West walls on N & S Coullion Ballroom | | |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Tuesday Oct 8 - Noon to Midnight

| Oct 8, Tuesday | MOVE IN | SETUP | INTEGRATION |
|----------------|--------------------|-------|-------------|
| 1200 Hours | | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | Bell Atlantic, MSU | | |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Wednesday Oct 9 - AM to Noon

| Oct 9, Wednesday | MOVE IN | BUILDUP | INTEGRATION |
|------------------|---------|---|-------------|
| 0000 Hours | | Install Power lines into the back rooms | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | | |
| 0800 | | | |
| 0900 | | | |
| 1000 | | | |
| 1100 | | | |
| Support → | Shannon | | |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Wednesday Oct 9 - Afternoon to Midnight

| Oct 9, Wednesday | MOVE IN | SET - UP | INTEGRATION |
|------------------|---|---|--|
| 1200 | OSF (includes FP TOC Priority Equipment) and Exhibit Crafts #1 Trucks arrive at Sheraton Dock | | |
| 1300 | | Power Installation | |
| 1400 | Unload OSF Truck (includes FP TOC Priority Equipment) and Exhibit Crafts Truck #1 (carpet, (2) skids of backwall) | Install Drapes | |
| 1500 | | Outline Theater Enclosures with tape | |
| 1600 | | | |
| 1700 | Unload Exhibit Crafts Truck #2 | Theater AV and Theater/FP TOC Tech Rooms Set Up | |
| 1800 | | Install LAN | |
| 1900 | | Install Carpet | |
| 2000 | | Construct Exhibit Structure | |
| 2100 | | | |
| 2200 | Loading Dock Curfew | | |
| 2300 | | | |
| Support → | Sheraton, GES, LMC | Sheraton, JTS, LMC, Ex C, GES | LMC, JTS, Technical Services, Anusoft, NRL, ARL, NVESD, FP TOC |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Thursday Oct 10 - AM to Noon

| Oct 10, Thursday | MOVE IN | SET - UP | INTEGRATION |
|------------------|--------------------------------|---|--|
| 0000 Hours | Loading Dock Curfew | Construct Exhibit Structure | Power Installation |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | Theater AV and TH/TOC Tech Rooms Set Up | |
| 0700 | | ISDN Lines | Install Backup T1 Line |
| 0800 | Unload Exhibit Crafts Truck #3 | Set Up CIGs | Install AC Units |
| 0900 | Unload Stand Alone Equip Truck | | |
| 1000 | | | IDREN WAN to LAN Integration & Test |
| 1100 | | | |
| Support → | Sheraton, GES, LMC | Sheraton, GES, LMC | LMC, JTS, LH, Anusoft, NRL, ARL, NVESD |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Thursday Oct 10 - Noon to Midnight

| Oct 10, Thursday | MOVE IN | SET UP | INTEGRATION |
|------------------|----------------------------------|--|--|
| 1200 Hours | | Construct Exhibit Structure | AUSA to IDREN Network Connection to SubNets Test |
| 1300 | | ISDN Stand Alone Lines | Long Haul |
| 1400 | Unload FP TOC Non Priority Truck | Displays Setup | Connectivity Test - All Theater & TOC Participants |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | Move In Complete | | |
| 2200 | | | |
| 2300 | | | |
| Support → | Sheraton, GES, LMC | Exhibit Crafts, GES, Standalone Participants | All LH and On-Site Theater FP TOC Participants |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Friday Oct 11 - AM to Noon

| Oct 11, Friday | MOVE IN | BUILDUP | INTEGRATION |
|----------------|------------------|--|---|
| 0000 Hours | | Construct Exhibit Structure | No Integration testing Planned Use This Time for Problems |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | Stand Alone Displays Setup | |
| 0800 | | FP TOC Theater Set Up | |
| 0900 | | Kitchen Set Up | |
| 1000 | | | |
| 1100 | | | |
| Support → | MOVE IN COMPLETE | Exhibit Crafts, GES, FP TOC, LMC, Stand Alones | All LH and On-Site Theater FP TOC Participants |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Friday Oct 11 - Noon to Midnight

| Oct 11, Friday | MOVE IN | SET UP | INTEGRATION |
|----------------|------------------|-----------------------------|---------------------------------|
| 1200 Hours | | FP TOC Theater Set Up | Scenario Tuning & Rehearsing |
| 1300 | | | PIC TEL Integration |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | MOVE IN COMPLETE | Set Up Complete | Integration Status Meeting |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Saturday Oct 12 - AM to Noon

| Oct 12, Saturday | MOVE IN | SET UP | INTEGRATION |
|------------------|------------------|-----------------|--|
| 0000 Hours | | | No Integration testing Planned Use This Time for Problems |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | | |
| 0800 | | | |
| 0900 | | | |
| 1000 | | | |
| 1100 | | | |
| Support → | MOVE IN COMPLETE | SET UP COMPLETE | Technical Rehearsal |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Saturday Oct 12 - Noon to Midnight

| Oct 12, Saturday | MOVE IN | SET UP | REHEARSAL |
|------------------|------------------|-----------------|---|
| 1200 Hours | | | Technical Rehearsal |
| 1300 | | | CHU Kirby's Playtime |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | CHU |
| 1800 | | | Integration Status Meeting |
| 1900 | | | Long Haul Integration Testing and Scenario Dry Runs |
| 2000 | | | CHU |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | MOVE IN COMPLETE | SET UP COMPLETE | All LHM/On-Site Theater FP TOC Participants |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Sunday Oct 13 - AM to Noon

| Oct 13, Sunday | MOVE IN | SET UP | REHEARSAL |
|----------------|------------------|-----------------|--|
| 0000 Hours | | | No Integration testing Planned Use This Time for Problems |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | CHU |
| 0700 | | | Power up and AM Readiness Tests |
| 0800 | | | Stand by carpenters |
| 0900 | | | Wipe Down |
| 1000 | | | CHU |
| 1100 | | | CHU |
| Support → | MOVE IN COMPLETE | SET UP COMPLETE | All LHM/On-Site Theater FP TOC Participants |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Move In Schedule - Sunday Oct 13 - Noon to Midnight

| Oct 13, Sunday | MOVE IN | SET UP | REHEARSAL |
|----------------|------------------|-----------------|--|
| 1200 Hours | | | |
| 1300 | | | Full Dress Rehearsal and VIP Walk Through |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | Post Rehearsal MTG |
| 2200 | | | Ready For Showtime |
| 2300 | | | |
| Support → | MOVE IN COMPLETE | SET UP COMPLETE | All LH and On-Site Theater FP TOC Participants |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Monday Oct 14 - AM to Noon

| Oct 14, Monday | DEMO TIME | SET UP | REHEARSAL |
|----------------|--------------------|--------------------------|----------------------|
| 0000 Hours | | | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | Pre-Demonstration Set Up | |
| 0800 | | | |
| 0900 | | | |
| 1000 | BE HOT | | |
| 1100 | | | |
| Support → | All Demo Personnel | All Demo Personnel | INTEGRATION COMPLETE |

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ADST II

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Demo Schedule - Monday Oct 14 - Noon to Midnight

| Oct 14, Monday | DEMO TIME | SETUP | REHEARSAL |
|----------------|---|-----------------|----------------------|
| 1200 Hours | BE HOT | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 |  | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | All Demo Personnel | SET UP COMPLETE | INTEGRATION COMPLETE |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Tuesday Oct 15 - AM to Noon

| Oct 15, Tuesday | DEMO TIME | SETUP | REHEARSAL |
|-----------------|--------------------|--------------------------|----------------------|
| 0000 Hours | | | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | Pre-Demonstration Set Up | |
| 0800 | BE HOT | | |
| 0900 | | | |
| 1000 | | | |
| 1100 | | | |
| Support → | All Demo Personnel | All Demo Personnel | INTEGRATION COMPLETE |

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ADST II

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Demo Schedule - Tuesday Oct 15 - Noon to Midnight

| Oct 15, Tuesday | DEMO TIME | SET UP | REHEARSAL |
|-----------------|---|-----------------|----------------------|
| 1200 Hours | BE HOT | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | |
| 1900 | | | |
| 2000 |  | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | All Demo Personnel | SET UP COMPLETE | INTEGRATION COMPLETE |

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ADST II

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Demo Schedule - Wednesday Oct 16 - AM to Noon

| Oct 16, Wednesday | DEMO TIME | SET UP | REHEARSAL |
|-------------------|--------------------|--------------------------|----------------------|
| 0000 Hours | | | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | Pre-Demonstration Set Up | |
| 0800 | BE HOT | | |
| 0900 | | | |
| 1000 | | | |
| 1100 | | | |
| Support → | All Demo Personnel | All Demo Personnel | INTEGRATION COMPLETE |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Demo Schedule - Wednesday Oct 16 - Noon to Midnight

| Oct 16, Wednesday | DEMO TIME | TEAR DOWN | Move Out |
|-------------------|----------------------|-------------------------------------|---|
| 1200 Hours | BE HOT | | |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | |
| 1600 | | | |
| 1700 | | | |
| 1800 | VIDEO TAPE | | |
| 1900 | Post Demo MTG | Tear Down AV and Computer Equipment | Tear Down Tech Rooms, Pic Tel Equip |
| 2000 | | Tear Down Exhibit Structures | |
| 2100 | | | Load ECI Truck #1 and Standalone Participants |
| 2200 | | | Truck Incl FP TOC to CO Springs, SGI, FedEx |
| 2300 | | | |
| Support → | All Demo Personnel | All Tear Down Personnel | INTEGRATION COMPLETE |

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ADST II

ADST-II-MISC-015R-9600247 (Month 8)

Tear Down Sched - Thursday Oct 17 - AM to Noon

| Oct 17 Thursday | DEMO TIME | TEAR DOWN | MOVE OUT |
|------------------|---------------|-------------------------------------|------------------------|
| 0000 Hours | | Tear Down Exhibit Structures | |
| 0100 | | | |
| 0200 | | | |
| 0300 | | | |
| 0400 | | | |
| 0500 | | | |
| 0600 | | | |
| 0700 | | | Move Out Continues |
| 0800 | | | ECI#1 (NE) |
| 0900 | | Tear Down AV and Computer Equipment | |
| 1000 | | | |
| 1100 | | | OSF (SE), EC#2 (NE) |
| Support → | DEMO COMPLETE | Exhibit Trails | LAIC, EA, Crafts - CES |

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ADST II

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Demo Schedule - Thursday Oct 17 - Noon to Midnight

| Oct 17, Thursday | DEMO TIME | TEAR DOWN | MOVE OUT |
|------------------|---------------|------------------------------|---------------------|
| 1200 Hours | | Tear Down Exhibit Structures | OSF (SE), EC#2 (NE) |
| 1300 | | | |
| 1400 | | | |
| 1500 | | | FP TOC (NE) |
| 1600 | | | |
| 1700 | | | |
| 1800 | | | ECI#3 (SE) |
| 1900 | | | |
| 2000 | | | |
| 2100 | | | |
| 2200 | | | |
| 2300 | | | |
| Support → | Demo Complete | Tear Down Complete | LMC, Ex Crabs, GHS |

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APPENDIX G - INTEGRATION PLAN

ADST II

ADST-II-CDRL-015R-9600195a

AE3 OSF INTEGRATION AND TEST

Orlando OSF Test General Assumptions

- WAN Test is Successfully Completed Prior to OSF Test
- Integration and Test is Broken into Three Phases:
 - Phase 1: OSF Preparation Aug 26 - 30
 - Phase 2: Point to Point Testing Sept 3 - 13
 - Phase 3: Scenario Testing Sept 17 - Oct 4
- All Testing is scheduled at Lockheed Martin for Monday Through Friday, 0900 - 1800 hours EST.
- Weekends are Make-up Time if we fall behind.

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LOCKHEED MARTIN **ADST II**

ADST-II-CDRL-015R-9600195a

AE3 OSF INTEGRATION AND TEST

Phase 1 - OSF Preparation

Aug 26 to 30

1. Allocate Space in the OSF for All Tests
2. Install ISDN Lines into OSF High Bay
3. Install Dedicated T1 to ARL
4. Install WAN Router on the Commercial T1 Line to ARL
5. Install and Test LAN
6. Install DIS Support Workstations on LAN
7. Point to Point Test of OSF to ARL Connection

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AE3 OSF INTEGRATION AND TEST**Phase 2 - Point to Point Testing****Sept 3 to 13**

- Point to Point Testing is scheduled Monday Through Friday, 0900 - 1800 hours Eastern Time
- East Sites Are: OSF, ARL, JVL, DBBL, D&SA, ARC
 - Point to Point Testing for East Sites is Scheduled for 0900 - 1200 hours Eastern Time
- West Sites Are: RTOS, SIMITAR, UDLF
 - Point to Point Testing for West Sites is Scheduled for 1400 - 1800 Eastern Time

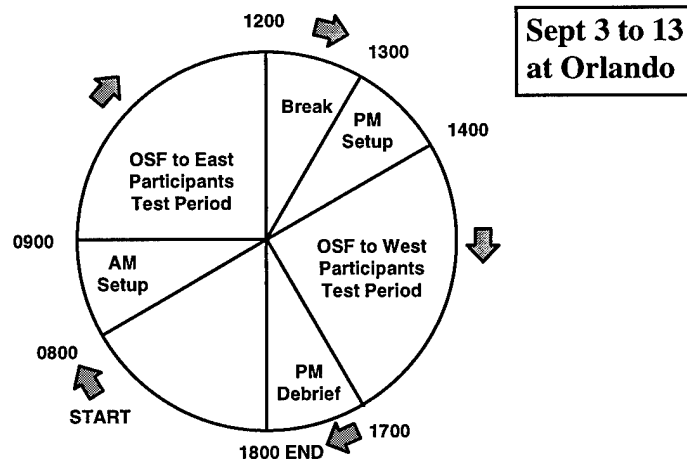
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AE3 OSF INTEGRATION AND TEST**Phase 2 - Point to Point Testing****Hourly OSF Point to Point Test Schedule**

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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing
Sept 17 to Oct 4**

- Long Haul Scenario Testing Combines All Sites (East and West) Over a Three week Period
- Mornings are Reserved for Problem Resolution and Test Setup (0800 - 1200 Eastern Time)
- Live Networked Testing is Scheduled Each Test Day for 1300 - 1700 Hours Eastern Time.
- First Two Weeks are Integration Test and Scenario Tuning
- Third Week is Formal Dry Runs

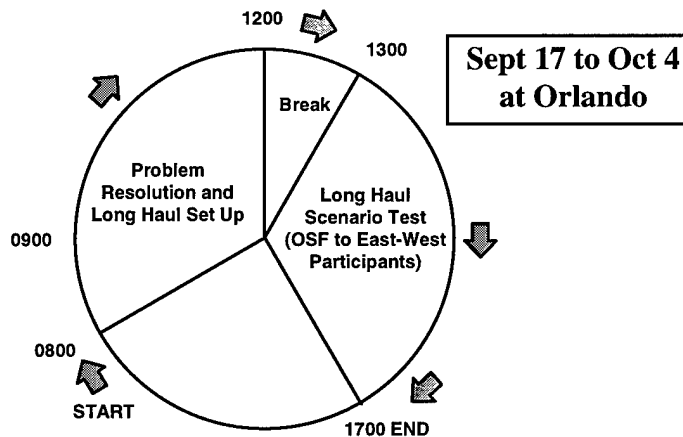
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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing****Hourly OSF Long-Haul Scenario Test Schedule**

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AE3 OSF INTEGRATION AND TEST**Phase 1 - OSF Preparation - Aug 26 to 30**

| DATE | OSF PREPARATION AND TEST ACTIVITIES | | |
|-------------------------|--|---|--|
| Aug 26 Monday | Prepare OSF High Bay for LAM TF equipment. | Complete Installation of T1 Router in OSF | Install and Test Stealth IG #1 at OSF (AcuSoft). |
| Aug 27 | Install All Network | ↑ | |
| Aug 28 | Install and checkout test DIS support equipment in OSF - | Establish OSF leased T1 to ARL Network Connectivity | ↑ |
| Aug 29 | (ModSAF, Data Loggers, Sound Storm) | ↓ | Early Data Capture of Virtual Simulator Shots. |
| Aug 30 Friday | | | |
| Support → | DIS | OSF, ARL | Manure Reader, AcuSoft, JYL |

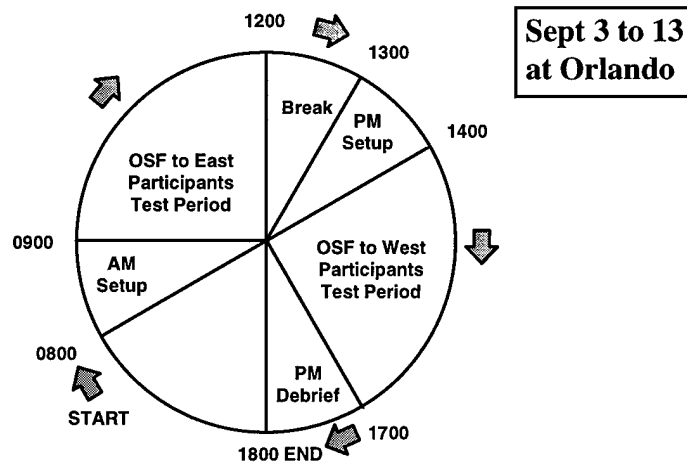
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AE3 OSF INTEGRATION AND TEST**Phase 2 - Point to Point Testing****Hourly OSF Point to Point Test Schedule**

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AE3 OSF INTEGRATION AND TEST**Phase 2 - Point to Point Testing - Sept 3 to 13**

| DATE | OSF TEST ACTIVITIES | | |
|--------------------------|--|-----------------------------------|---|
| Sept 2 Monday | HOLIDAY | | |
| Sept 3 | ↑ Point to Point Reachability Testing to WAN Participants from OSF ↓ | SAFOR JVL | Early Integration for IG's & |
| Sept 4 | | Reachability Testing | Database (SGI Integration) |
| Sept 5 | | SAFOR JVL | and Early Data Capture of |
| Sept 6 Friday | | Appearance Testing at OSF | Virtual Simulator Shots. |
| Support → | DBBL, D&SA, UDLP, SIMITAR, RTOS, ARC, EMC | JVL, ITEMS, EAGLE, ModSAFE/EMC | NVESD, ARL, NPS, AcuSoft, Maguire Reeder |

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AE3 OSF INTEGRATION AND TEST**Phase 2 - Point to Point Testing - Sept 3 to 13 (Continued)**

| DATE | OSF TEST ACTIVITIES | | | |
|---------------------------|--|--|--|--|
| Sept 9 Monday | ↑ | ↑ | ↑ | ↑ |
| Sept 10 | Point to Point Appearance Testing | Immersive Theater Audio/Visual Installation at OSF, Stand Alone Test, Video Source | Install AE3 Scenario Test Equipment at OSF (MCS/P, ASAS, BPV, MBONE, LWSE, Scout) | Data Capture of Virtual Simulator Shots. |
| Sept 11 | and Point to Point | Verification, Video Output | | |
| Sept 12 | Database Correlation Testing | Calibration | | |
| Sept 13 Friday | ↓ | ↓ | ↓ | ↓ |
| Support → | JVL, DBBL, D&SA, UDLP, SIMITAR, RTOS, ARC, EMC | Impact Technical Support | JVL, D&SA, UDLP, SIMITAR, ARC | Maguire Reeder, A&S, NPS, NVESD, ARL, JVL |

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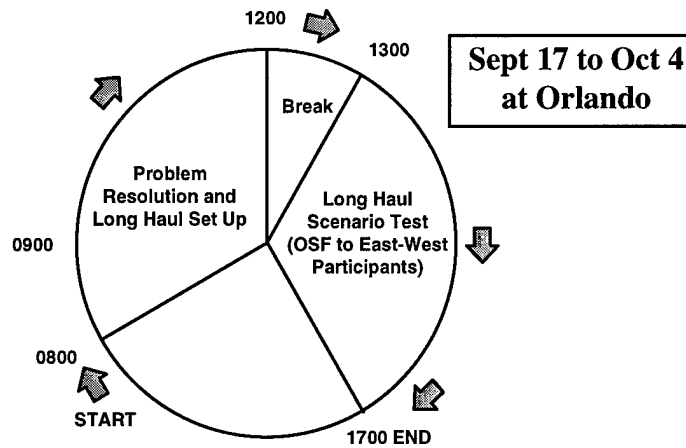
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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing****Hourly OSF Long-Haul Scenario Test Schedule**

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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4**

| DATE | OSF TEST ACTIVITIES | | |
|-----------------------|---|------------------------------|---|
| Sept 16 Monday | Travel Day - Scenario Testing Support Personnel Travel to Orlando PRE BADGING FOR OSF ENTRY IS A MUST! | | |
| Sept 17 | ↑ | ↑ | ↑ |
| Sept 18 | Scenario Tuning & Debug (Mornings) | Theater Dry Run (Afternoons) | Data Capture of live and Data Logged Scenario Shots (Daily All Day) |
| Sept 19 | ↓ | ↓ | ↓ |
| Sept 20 Friday | ↓ | ↓ | ↓ |
| Support → | ALL DISTRIBUTED PARTICIPANTS | | |

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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4**

| DATE | OSF TEST ACTIVITIES | | |
|--------------------------|--|------------------------------------|---|
| Sept 23 Monday | ↑ | ↑ | ↑ |
| Sept 24 | ↑ | ↑ | ↑ |
| Sept 25 | Scenario Tuning & Debug (Mornings) | Theater Dry Run (Afternoons) | Data Capture of live and Data Logged Scenario Shots (Daily All Day) |
| Sept 26 | ↑ | ↑ | ↑ |
| Sept 27 Friday | ↓ | ↓ | ↓ |
| Support → | ALL DISTRIBUTED PARTICIPANTS | | |

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AE3 OSF INTEGRATION AND TEST**Phase 3 - Long Haul Scenario Testing - Sept 17 to Oct 4**

| DATE | OSF TEST ACTIVITIES | | |
|--------------------------|--|-------------------------------|---|
| Sept 30 Monday | Scenario Tuning | Theater Dress Rehearsal | Data Capture of live Scenario Shots |
| Oct 1 | | | |
| Oct 2 | Final Formal End-to-End Rehearsals and Capture of Live Data | | |
| Oct 3 | | | |
| Oct 4 Friday | Pack all OSF located Equipment for Shipping to AUSA (Includes FP TOC Priority Equipment). Current Plan is to Unload this Equipment into the Cotillion Ballroom at 1500 hours on Wednesday 9 Oct. | | |
| Support → | ALL DISTRIBUTED PARTICIPANTS | | |

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APPENDIX H - IPR MINUTES

SUBJECT: Minutes of the Initial Planning Conference (In-Process Review # 1) for the 1996 Army Experiment

1. The Initial Planning Conference was held on 11 and 12 December in Grant Auditorium, at Fort Leavenworth, Kansas. The purpose of the conference was to bring together representatives of the various organizations to exchange ideas and discuss potential ideas and concepts for inclusion in the 1996 Army Experiment. The planned agenda is at Enclosure 1. A copy of the sign-in roster is at Enclosure 2.

2. LTC Kirby Brown opened the session at 1300 hours, 11 December. He introduced himself to the group and explained the mission of the Louisiana Maneuvers Task Force (LAM TF) and its responsibilities as related to the Army Experiment and the Annual AUSA Symposium. He quickly went over administrative announcements and instructions, then explained the agenda for the two-day working session. As many were participating for the first time, individuals were requested to introduce themselves to the group and identify the command and/or project they were representing.

3. LTC Brown explained the nomenclature of the Army Experiment (AE) and why we are referring to the 1996 Army Experiment as AEIII (AE3). The AUSA convention and AEIII are separate and distinct. He stressed that the purpose of AEIII is to provide an accelerated experimental forum for the Army and that the AUSA convention is simply where those experiments that are demonstrable will be showcased. Technology is moving at an explosive pace and we are trying to exploit it for the future. We want to strive for the art of the possible, oriented towards 10 years out. The Army Experiment is also separate from, but functions as part of the Army's Strategic Communications Plan. He then went over and explained the "Prevailing Philosophies" that are the operating principles for the Army Experiment:

a. America's Army is a changing organization... significantly different from the Cold War Army; currently undergoing major reengineering efforts to address the 21st Century environment.

b. America's Army is a learning organization... always improving: never resting on its laurels; willing to learn from industry and academia.

c. Only by leveraging Information Age technology can America's Army remain the best army in the world, capable of land force dominance into the 21st Century.

d. America's Army, as a steward of our Nation's resources, intends to leverage the significant modernization investments made over the past decade and focus future modernization efforts on those technologies/systems that will provide the greatest payoff on the battlefield.

4. LTC Brown discussed last years Army Experiment (AEII), explaining the three components: the Virtual Theater, the Force Projection Tactical Operations Center (FP TOC), and the Army Experiment displayed in the Cotillion Ballroom. He explained the linkages/Synthetic Theater of War (STOW) and the inner and outer wall displays (Tiers II and III). He then presented the logical network and the top-level architecture (Enclosures 3 and 4).

5. Mr. Jim Calpin, Mitre Corporation, presented a strawman concept (Enclosure 5) for this year's Army Experiment.

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a. The developmental goal was to identify a new and innovative concept that maximizes visitor interest and learning while minimizing cost. More Joint/Combined play is highly desirable.

(1) A possible theme, "Information Operations in the 21st Century," could highlight how the Army is leveraging cutting-edge information technologies to enhance the complete spectrum of warfighting concerns. The central focus of the floor display would be a "TOC of the Future," combining existing/developmental C4I systems with "new" capabilities (e.g., COA wargaming, battlefield visualization, VTC, etc.)

(2) TOC operations in a true STOW environment could include operational interface with live forces in the field at the NTC (3rd ACR: 6-19 Oct 96) and at the JRTC (82nd ABN: 12-23 Oct 96). Integration of Corps Level Computer Generated Forces (CLCGF) and STOW-TMD to simultaneously drive C4I systems in both the corps/division level TOC and the FP TOC would provide leave-behind experimental capability.

b. This presentation resulted in a good discussion of the need to involve the other services and also to show the benefits to the soldier of situational awareness, COA analysis, the STOW environment, and C4I.

c. LTC Brown reminded everyone that this strawman concept was just a point to launch from and that the final concept could be very similar or quite different. The intent of the presentation was to get everyone thinking of the possibilities.

6. MAJ Hamilton, Force XXI Logistics Office, presented possible ideas and concepts (Enclosure 6) developed by AMC; primarily the Combat Synthetic Test Training Assessment Range (STTAR) and Survivable Armed Reconnaissance on the Digitized Battlefield (SARDB).

7. MAJ Al Gammons, Army Space Command, explained the relationship between the Space and Strategic Defense Command (SSDC), the FP TOC, and the Missile Defense Battle Integration Center (MD BIC). He stated that they want to get Air Force simulations and AEGIS into play. ARSPACE wants a training event, not a demonstration, at AUSA. They are looking for a rehearsal capability for real world contingencies. The FP TOC can probably be distributed; therefore, it won't be necessary to send the whole FP TOC to AUSA. His presentation is at Enclosure 7.

8. LTC James Wall, Army Research Laboratory, presented a briefing (Enclosure 8) on the Virtual Sand Table (VST). The technology already exists and could be a stealth viewer for DIS simulations. Interface with the sand table can be accomplished through voice recognition and/or gestures.

9. Mr. Ralph Burkhart, Draper Laboratory, presented what the Joint Technology Center System Integration Laboratory is currently developing that might be of utility to AEIII. A copy of his briefing, "UAV Simulation Support for III Corps Training Exercises" is at Enclosure 9. Mr. Milton Adams followed up with a briefing (Enclosure 10) on their C4I efforts working with ARPA and the Navy. They are very involved in information sharing and collaborative training.

10. The working session was adjourned at 1700 hours and reconvened at 0800 hours the following morning.

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11. LTC Ken Johnson, TRADOC DCST, presented a Distance Learning briefing (Enclosure 11) highlighting their plans to support US Army training in Bosnia.
10. Dr. Tom Warren, Research Triangle Institute, reviewed last year's Virtual Theater set-up and explained the theater's capabilities, including planned upgrades to the project. His presentation is at Enclosure 12.
11. MAJ John Campbell, Battle Command Battle Lab, introduced the FXXI Battle Command Combat Information Center (CIC) that provides a division-level relevant common picture for the commander. That presentation is at Enclosure 13.
12. Mr. Jan Chervenak, Dismounted Battlespace Battle Lab (DBBL), provided information (Enclosure 14) on the DBBL Simulation Center experiment that focuses on individual leaders and discussed how they might incorporate other services into the experiment.
13. Mr. Tom Smith, Simulation Training and Instrumentation Command (STRICOM), explained STRICOM's functions and responsibilities in its relationship with the LAM TF and the Army Experiment. He also explained the changeover of experiment integration and testing activities from Loral to Lockheed Martin; the latter being awarded the new 5-year Advanced Distributed Simulation Technology (ADST) support contract. He advised the group that STRICOM had completed its own Technical After Action Report of AEIII (copy at Enclosure 15) and that he would provide copies upon request. Copy requests should be directed to Tom Smith, e-mail: smitht@stricom.army.mil or phone (407) 384-2387 (DSN 960-8826).
14. Ms. Virginia To Kaste, Army Research Laboratory, presented a briefing (Enclosure 16) on the Variable Resolution Terrain Model. With the proper resolution, the model can reflect cratering, punching holes in walls, effects of weather on terrain, etc. The model can create user-defined terrain to the user's specified resolution. The model is also DIS compatible so it can run with ModSAF and other models.
15. Mr. Mike Hannon, TRADOC Analysis Center (TRAC), presented an overview (Enclosure 17) of the Corps Level Computer Generated Forces (CLCGF) architecture. Mr. Dave Prybyla followed with a summary (Enclosure 18) of what was learned during JPSD 95, which linked CBS with CLCGF.
16. MAJ Don Renner, Office of the Director for Information Systems for Command, Control, Communications, and Computers (ODISC4), explained what DISC4 is and does, then presented their concept for AEIII. The concept presented one congealing thought: One Army -- One Architecture for interoperability and joint projection. This would be accomplished through the demonstration of the Warfighter Information Network (WIN). Their concept briefing is at Enclosure 19.
17. LTC Brown led an open discussion of the AEIII concept. He explained the savings to be made by testing connectivity via long haul. Past successes support the belief that we may be able to long-haul individual experiment activities to the AUSA demonstration and leave the bulk of the equipment and personnel at home station. He expanded this idea into his vision of how the AUSA demonstration could be laid out. He wants to make it more audience interactive with a series of vignettes, synchronized with the overall scenario, showcasing the activities at remote locations. It would be an immersive environment linked to the virtual and real domains.

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18. A working group chaired by Mr. Joe Jennings, Mitre Corporation, was established to flesh out the concept. The concept should show how we will develop a distributed experimental capability that can be used to conduct/support experimentation on Force XXI issues (especially relating to C4I and Information Operations), and support a demonstration of the "art of the possible" in Information Operations at the AUSA convention in Oct 1996. The concept should include a statement of the objectives of the experiment in general and the AUSA demonstration in particular, a basic unifying theme for the AUSA demonstration, a recommended list of participating systems for both the experiment and the AUSA demonstration, a brief description of each system's role, a graphic of the AUSA demonstration, an overview of the technical architecture, and a milestone schedule for implementing the concept. Appointed work group members include LTC Dave Tyner, Mr. Ulf Helgesson, MAJ Al Gammons, Mr. Jan Chervenak, MAJ Don Renner, MAJ John Campbell, Ms. Virginia To Kaste, MAJ James Vaglia, and representatives from TRAC and STRICOM/Lockheed Martin. The group will meet 8-9 January 1996 in the Washington DC area. Results of their work will be distributed via e-mail to all AEIII participants by 19 January. The draft concept will be used as the basis for further developments of individual experiments and the building of a cohesive final concept. This will serve as the intent for the next IPR.

19. The consensus of the attendees was that the following should be developed/identified as potential candidates for inclusion in AEIII:

- a. Corps Level Computer Generated Force (CLCGF)
- b. Virtual Sand Table
- c. Dynamic Terrain
- d. Network - ATAI/ISDR (ADS)
- e. Ultra-small light-weight portable computers
- f. Classroom XXI / Education XXI
- g. BCBL Combat Information Center
- h. DBBL WARLINK
- I. FP TOC
- j. Total Army / Joint participation
- k. Virtual Theater
- l. Warfighter Information Network (WIN)
- m. Joint collaboration at the command level

20. After polling the attendees, it was decided that the next In-Process Review (IPR #2) will be held in Orlando, Florida, starting at 0900 hours 30 January 1996 and ending at 1200 hours on 31 January. The purpose of this IPR will be to further define the integrated experiment concept and distributed display

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module. The final concept from this IPR will be presented for design approval to the CSA/VCSA/DAS in mid-February. The February IPR will be the decision point and beginning of technical design. Further information and agenda for the February IPR will be distributed separately.

21. LTC Brown summarized the accomplishments of the IPR and answered all remaining questions. He then thanked all the participants for their hard work and contributions, closing the conference at approximately 1200 hours, 12 December.

22. Copies of briefings were available during the conference and are not included for distribution with these minutes. Briefings are maintained on file and additional copies are available upon request through Ken Wren.

23. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

(s)

Kirby R. Brown
LTC, QM
LAM Task Force

19 Enclosures
as
(Enclosures omitted)

Date: 17 January, 1997

SUBJECT: Minutes of In Process Review # 2 for Army Experiment III (AE3)

1. The second In Process Review was held on 30 and 31 January in Ballroom C of the Holiday Inn - University of Central Florida, Orlando, Florida. The purpose of the conference was to develop a list of proposed sub-experiments and a demonstration concept plan for the 1996 Army Experiment. The planned agenda is at Enclosure 1.

2. LTC Kirby Brown opened the session at 0900 hours, 30 January. He introduced himself and welcomed those in attendance. Since there were many new to the Army Experiment, attendees were asked to identify themselves to the group. A list of the attendees is provided at Enclosure 2. An updated points-of-contact (POC) roster is also provided (Enclosure 3) for your information and use.

3. LTC Brown discussed the mission of the Technical Concept Development Team that met 17-18 January at Mitre in McLean, VA. He stated that the team's recommended concept is the starting point for this year's efforts. He further explained that the Synthetic Theater Of War (STOW) environment is the primary infrastructure of the Experiment and the plan is to exploit/expand on that. He then went over the objectives for the IPR:

a. To Develop:

- (1) The candidate list for this year's experiment.
- (2) The AE3 integrated experiment concept.
- (3) A distributed display concept for the AUSA demonstration.

b. To Prepare:

- (1) For late February concept briefing to DAS/VCSA/CSA.
- (2) The technical design.

4. Mr. Jim Calpin, Mitre Corporation, presented the conclusions and recommendations of the Technical Concept Development Team (Enclosure 4). A suggested theme for AE3 is "America's Army...Warriors for the Information Age." He started with an explanation of the relationship of AE3 with the AUSA exhibition and was followed by Mr. Joe Jennings, Mitre Corporation, who briefed the proposed AE3 simulation architecture (Enclosure 5).

a. The basic features of that architecture are that it must be:

- (1) Reconfigurable - nodes selected for specific experiment needs.
- (2) Capable of supporting a wide variety of constructive, virtual, and live simulations with possibly more than one type of simulation at each node.
- (3) Capable of supporting a variety of data protocols with multicast routing.
- (4) Require minimal modifications to the simulation networks at each node.

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(5) Inexpensive to set up and maintain.

b. In the future, the high-level architecture (HLA) will meet these requirements. In the short term, the Joint Precision Strike Demonstration/Corps-Level Computer-generated Force (JPSD/CLCGF) architecture is a viable alternative.

5. Mr. Phil Dykstra, Army Research Laboratory (ARL), presented several AE3 communications options and explained the costs associated/anticipated with each option (Enclosure 6). First-cut estimate based on 12 month duration option is between 1.2 and 2.2 million dollars. We owe Mr. Dykstra a refined list of node sites and closer duration estimate. Possible ways to lessen or share these costs with other agencies were discussed.

6. Mr. Calpin continued with a general laydown of the three physical elements anticipated at the AUSA demonstration: Cotillion Ballroom (Theater and Interactive Demos), FP TOC (probably on site), and Foyer/Information Desk. He explained that the AE3 message would be told through a series of vignettes (the theater scenario) framed by or linked to the C4I objectives of Project and Sustain, Protect the Force, Win the Information War, Conduct Precision Strike, and Dominate Maneuver.

7. Mr. Ulf Helgesson, IDA, elaborated on the physical layout planned for the Cotillion Ballroom (AUSA demonstration). He stressed that the theater should be interactive multimedia and that the stand-alone demos should have high "grab" value (be spectacular). He also reminded everyone that space this year would be as limited and critical as last year, if not more so.

8. LTC Mike Bowman, AMC, presented 21st Century Logistics for Force XXI (Enclosure 7). He proposed that AMC participate in the theater (with two logistics vignettes) and also have a stand-alone, interactive, Logistics Information Systems Display. Ms. Kim Wright, AMC, presented an update on the Logistics Anchor Desk (LAD) and its involvement in real-world operations (Enclosure 8). She will provide LTC Brown an update on what ATTCS and simulations LAD currently links with. Mr. John Smith, MICOM, followed with a presentation on a wearable computer system (maintenance technology) and explained the capabilities it provided (Enclosure 9).

9. MAJ Brian Birdwell, BCBL-Leavenworth, presented WARLAB XXI proposal (Enclosure 10). It consisted of the Army Battle Command System/ATTCS, the Course of Action Support Tool, and the Mission Planning and Rehearsal Training System.

10. Mr. Jan Chervenak, DBBL, presented a "Benning Node" strategy (Enclosure 11) whereby all equipment would remain at Fort Benning and participate via longhaul. He proposed two thrusts: Soldier digitization/Situational awareness included a soldier computer, helmet mounted display, day camera, thermal sight, and night vision device; Simulator/Simulation Technology Integration included WarLink, McKenna Military Operations in Urban Terrain (MOUT), Simulation and Training Aid for the Dismounted Soldier (STRADIS), and INFOSCOPE.

11. Mr. George Rumford, White Sand Missile Range (WSMR), briefed the Combat Synthetic Test and Training Assessment Range (Combat STTAR) (Enclosure 12). He explained their concept and efforts to combine testing with training. He discussed what they have been doing, then expanded to what they want to do in the operational future.

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12. Mr. Ed Arendt, TRADOC Analysis Center (TRAC), presented TRAC's support and participation in AE3 (Enclosure 13). TRAC wants to help provide the overall synthetic battlefield and help demonstrate the interaction of real or prototype C3I systems within the synthetic environment. He expressed some concern about remoting (longhaul participation), but stated that TRAC would like to gain more experience in this area.
13. LTC James Wall, Army Research Laboratory (ARL), presented the Virtual Sand Table (VST) and briefly discussed a Virtual Unmanned Aerial Vehicle (VUAV). His presentation is at Enclosure 14.
14. Ms. Virginia To, ARL, presented a short demonstration video and then a briefing on the generation of realistic dynamic events in real-time (Enclosure 15). This included weapons effect modeling on structures (blast and penetration) as well as on terrain (cratering). She would like to integrate these capabilities into other experiments versus using as a stand-alone display or demonstration.
15. Ms. Chris Spiegl, Texas Instruments(TI), presented how TI wants to focus its contribution on the value of sensor information (Enclosure 16). This would be demonstrated in the STOW environment (theater), and in a stand-alone display. The display could also be linked with Comanche, the TOC, or any other player. The baseline vehicle simulator could be either the sensor or the shooter, and was suggested to be an M1A2 tank.
16. Mr. George Jaques, Coleman Research Corporation (CRC), presented an overview of the Missile Defense-Battle Integration Center (MD-BIC) proposal (Enclosure 17). MD-BIC wants to link the DIS domains within the experiment architecture. Ms. Dai Chu continued with a presentation of MD-BIC issues (Enclosure 18), then briefed Weather Implementation effects (Enclosure 19). MAJ Al Gammons followed with an explanation of Synthetic Battlefield Environment (SBE) architecture (Enclosure 20). ARSPACE would like to expand the training value of the FP TOC and add an after-action-review capability.
17. Mr. Ken Overturf, ARINC (with SSDC), presented the Global Broadcast System and its architecture (Enclosure 21). He then presented a briefing (Enclosure 22) on LEOCOMM (Low-Earth-Orbit Communications) system capabilities. He suggested that a static display could demonstrate real-time communication and tracking capabilities at the AUSA demonstration.
18. LTC Mark Jefferson, OSD-DMSO, presented the DOD Modeling and Simulation Strategy (Enclosure 23), including the Modular Re-configurable C4I Interface (MRCI) notional design, and the goals of the High Level Architecture (HLA).
19. Mr. Don Ariel, RAYDON, provided information (Enclosure 24) on the Bradley vehicle training simulator (Bradley FIST) currently under sponsorship of ARPA SIMITAR. AE3 could help move the project toward completion and provide increased reserve component participation in AE3.
20. MAJ Don Renner, ODISC4, presented the concept of "One Army, One Architecture" (Enclosure 25), which demonstrates the connectivity of all systems via the Warfighter Information Network. This could be accomplished with a stand-alone or integrated display.
21. Due to the lateness of the hour, LTC Brown quickly explained his expectations for the next days activities, and at 1700 hours adjourned the meeting until the following morning.

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22. LTC Brown reconvened the IPR at 0830 hours, 31 January, went over the days agenda, then resumed the proponent briefings.

23. Dr. Tom Warren, Research Triangle Institute, presented the Virtual Theater concept (Enclosure 26) for a real-time, 3-D, immersive, interactive, synthetic environment with sound. This exhibit would be mobile and available to different audiences at low cost. He suggested that the Virtual Theater can act as an introductory area to the STOW immersive environment as well as a "to learn more" center for browsers after the STOW immersive environment. Dr. Warren also presented a briefing (Enclosure 27) of the Virtual Maintenance Assistant and Trainer (VMAT), to include possible vignettes involving both medical and maintenance scenarios.

24. MAJ Ed Healy, PEO-Aviation, discussed Longbow Apache and Comanche simulators. He stated that they should be considered for remote use only. He then covered the Army Airspace Command and Control System (A2C2S) Program and its system architecture (Enclosure 28). The A2C2S is basically a battalion jump-TOC in a Blackhawk platform.

25. LTC Neil Fay, Medical Advanced Technology Management Office (MATMO), briefly highlighted several areas to be considered for stand-alone displays: MediTag, CareMed, MediCam, Life Support for Trauma and Transportation (LSTAT), Personnel Status Monitor (PSM), and TeleMedicine.

26. LTC Brown then reviewed all the proposals to clarify and distill the various concepts and to coordinate concepts that supported each other. The following paragraphs outline the refined concepts and the pertinent discussion.

a. AMC - The Log Anchor Desk (LAD) will be considered for part of the theater presentation and will be distributed. AMC's technical objective for the LAD is due from Ms. Wright by 2 February. The Telemaintenance concept is a possible stand-alone, interactive demonstration. Concept is to consolidate four primary telemaintenance programs into one and port a small, belt-mounted wireless computer.

b. BCBL - WARLAB XXI consists of three components - ATCCS, COAST, and MPRTS. All are MCS/P compatible and distributable. The concept is to demonstrate the training capability that WARLAB XXI provides, using MPRTS and COAST tools as backbone for C2 tools at the tactical level.

c. DBBL - The concept is twofold: to depict soldier digitization and its evolution from the Warrior Focus AWE through the TF XXI AWE and to insert live combatants into virtual simulation to show technological integration. The technical enhancement is completing the virtual battlefield paradigm. There is possible Marine Corps interest in this proposal and interest by the FP TOC to have a dismounted INFOSCOPE-type sensor to provide a sensor-to-shooter link for deep strike. ARL dynamic terrain will support the DBBL effort.

d. Combat STTAR - The concept is to possibly have STTAR support a distributed live part of the theater with Mr. Jennings of MITRE working applications.

e. TRAC - TRAC provides a distributed synthetic system (ModSAF/EAGLE) which allows a viable ground maneuver synthetic environment to a corps-level base scenario. There will be a backup simulation on site if initial tests indicate communication problems from Fort Leavenworth.

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f. ARL: Virtual Sand Table - The concept is for the virtual sand table to be an interactive, stand-alone demonstration to depict a C2 environment tool which may have mission rehearsal capabilities. It will use terrain compatible with the theater scenario. MAJ Birdwell from BCBL will get LTC Wall the needed MCS/P data to try to use the sandtable in conjunction with MCS/P. The technical enhancement is an interactive 3-D terrain application for commanders.

g. UAV - The concept is for a monitor and input device portraying virtual UAV based on the theater scenario to provide an interactive demonstration. At this point, the UAV provider may be ARL or another organization. If FP TOC requires the virtual UAV, they have ARL's priority. The technical enhancement would be a realistic sensor-to-shooter training capability for the staff and shooters.

h. ARL: Dynamic Terrain - The concept is for dynamic terrain to support DBBL with the McKenna database in the synthetic environment. It will support other applications, if appropriate. The technical enhancement is the ability to dramatically change simulation terrain on desktop machines.

i. Texas Instruments - The concept is to use an appropriate vehicle simulator to focus on sensor information with emphasis on night sensor-to-shooter links. This will be an interactive demonstration on an approximately 9x6 foot platform. It may also be a data source for other demonstrations or the FP TOC to provide sensor data for other systems to act on.

j. SSDC - Overall Concept is to link the three domains of the synthetic environment to depict a number of battlefield applications. They propose several experiments to integrate this concept.

(1) SSDC MDBIC - The AEROSTAT and weather implementation capabilities can be used to enhance other proposals as needed. These capabilities will be distributed.

(2) The concept is to replicate a generic future TOC actively operating. The TOC will attempt to have all remote feeds come through one input. The technical enhancement will be an AAR capability for the TOC which allows the participant to critique their actions on mission execution.

(3) ARSPACE: GBS - The concept is to depict the GBS providing an in-theater downlink capability broadcasting necessary scenario data to support other proposals or the theater presentation. The method would be a hand-held transmitter calling for imagery of a specific grid.

(4) ARSPACE: LEOCOMM - Same as GBS above for application, problem is satellite coverage and timing.

k. NGB: SIMITAR - The concept of this proposal was to provide an M2 simulator depicting a training simulation used by the National Guard to train individual and collective M2 tasks. The technical enhancement was the use of technology to increase training efficiency.

l. RTI: Virtual Theater - The concept is to use the virtual theater as a STOW immersive environment and a "learn more" center for browsers. It would also provide interactive tours of AE1 and AE2.

m. PEO AVN: Comanche, Apache Longbow and A2C2S - The concept for the Comanche and Apache Longbow simulators is to support the main synthetic environment distributed from Fort Rucker. There is also a stand-alone demonstration capability for the A2C2S mockup which can link to MCS/P.

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n. MATMO: MediTag, MediCam, CareMed, LSTAT - The concept is for a stand-alone, interactive demonstration to illustrate the application of these technologies. There is a possibility for non-interference TeleMedicine input from Bosnia. LTC Fay promised a more complete proposal by 2 February.

27. DMSO: Presented an overview MCRI. This is a parallel effort being worked within the Army Experiment for this year. This effort will work in tandem with the TRAC CLCGF project.

28. LTC Brown discussed the status of the IPR objectives, then went over the Cotillion Ballroom layout. He envisions three to five stand-alone displays in the loiter area, and a theater with a synthetic environment that highlights the use of technology.

29. LTC Brown informed the group that the video tape and pamphlet used last year would be replaced by a CD-ROM for AE3. LTC's Tom Smart and Scott Fernald are the leaders for this project.

30. The next In-Process Review (IPR #3) will be held in the Holiday Inn-UCF, Orlando, Florida, starting at 1300 hours 5 March and ending at 1200 hours, 6 March. Further information and agenda for IPR# 3 will be distributed at a later date.

31. LTC Brown summarized the accomplishments of the IPR and answered all remaining questions. He promised that the minutes of this IPR, including a POC roster, would be distributed by next Monday (5 Feb). He also announced that a copy of the concept briefing (to be) given to the CSA/DAS would be distributed prior to the next IPR. A letter of instruction and request for individual proponents' technical concept requirements should also be sent out before the next IPR. He then thanked all the participants for their hard work and contributions, closing the conference at 1120 hours, 31 January.

32. Copies of briefings (enclosures) are not included for distribution with these minutes. Attendees selected particular briefings of interest before departing the IPR and copies of those briefings were separately faxed to the requesters. Briefings are maintained on file and additional copies are available upon request through Ken Wren.

33. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

Kirby R. Brown
LTC, QM
LAM Task Force

28 Enclosures
as

Enclosure 1

IPR #2 Agenda

30 January 1996

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| | | |
|------|---|------------------------------|
| 0850 | Sign-in/settle-in | |
| 0900 | Welcome, admin announcements, and opening remarks | LTC Brown |
| 0915 | Report/discussion from the concept development working group | Jim Calpin |
| 1000 | Experiment proposals: | AMC BCBL DBBL DSABL |
| 1200 | Lunch break | |
| 1300 | Experiment proposals: | TRAC ARL All others |
| 1645 | Summary of days activities and assignment of working groups as required | LTC Brown |
| 1700 | Adjourn | |

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| | | |
|------|---|-------------|
| 0830 | Reports of working groups | If required |
| 0900 | Integrated display module concept discussion | LTC Brown |
| 1030 | Final display module design | LTC Brown |
| 1120 | Future tasks, suspenses, and IPR schedule | LTC Brown |
| 1150 | Summary and closing remarks | LTC Brown |
| 1200 | Close | |

Enclosure 2**IPR #2 ATTENDEES**

ARIEL, Don
ANASTAS, Kevin LTC

Raydon Corp (SIMITAR)
LAM TF (Pentagon)

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Date: 17 January, 1997

ANDERSON, John LTC
ARENDT, Ed
BARHAM, Paul
BIRDWELL, Brian MAJ
BOWMAN, Mike LTC
BRENNAN, Joe
BROWN, Kirby LTC
CALPIN, Jim
CHERVENAK, Jan
CHU, Dai
CORREA, Mario
COSBY, Mark
DYKSTRA, Phil
EDWARDS, Bob
ERIKSSON, Karl
FAY, Neil LTC
FERNALD, Scott LTC
FISH, E.G.
GAMMONS, Al MAJ
GEDDES, John LTC
HEALY, Ed MAJ
HELGESSION, Ulf
HERSEY, Mike LTC
JACQUES, George
JEFFERSON, Mark LTC
JENKINS, Rick
JENNINGS, Joe
JOHNSON, Kenn LTC
KALAF, Michael
KEARNY, David
KUENE, Cindy
LOCKE, Linda
NIFONG, Michael LTC
NOVAK, Jason
O'BYRNE Jim LT (USN)
OVERTURE, Ken
REGALDO, Frank
RENNER, Don MAJ
RESSLER, Richard LTC
RUMFORD, George
SMART, Thomas LTC
SMITH, John V.
SMITH, Tom
SPIEGL, Chris
TO, Virginia
TYNER, Dave LTC
WALL, James LTC
WARREN, Tom
WREN, Ken

ARSPACE
TRAC
Naval Postgraduate School
BCBL (Fort Leavenworth)
AMC Force XXI Synchronization Office
STRICOM PM CAAN
LAM TF (Fort Leavenworth)
Mitre
DBBL Sim Ctr (Fort Benning)
SSDC-MDBIC
Inst Dev Dir WSMR
SAIC
ARL
Lockheed Martin Loral
STRICOM
MATMO
LAM TF
Lockheed Martin Loral
ARSPACE
ARL/LAM TF
Comanche PMO
Institute for Defense Analysis
NGB Joint Venture Axis
CRC (represents SSDC)
OSD, DMSO
ARSPACE
Mitre
DCST TRADOC TDAD
Lockheed Martin Loral
Texas Instruments
NCCOSC RDTE
AMC LOGSA
BCBL-H
Mitre
NRAD
ARINC (with ARSPACE)
STRICOM-PM-CAAN
ODISC4
Army Model And Simulation Office
Inst Dev Dir WSMR
LAM TF
MICOM
STRICOM, PM CAAN
Texas Instruments
ARL
LAM TF (Carlisle)
ARL
Research Triangle Institute
Cubic (supporting LAM TF)

Date: 17 January, 1997

WRIGHT, Kim

Army Materiel Command

Date: 17 January, 1997

SUBJECT: Minutes of In Process Review # 3 for Army Experiment III (AE3)

1. The third In Process Review was held on 28 and 29 March in Ballroom C of the Holiday Inn - University of Central Florida, Orlando, Florida. The purpose of the conference was to present the demonstration concept plan for the 1996 Army Experiment, review candidate experiments and technical plans, and further develop the theater scenarios. The original agenda is at Enclosure 1.

2. LTC Kirby Brown opened the session at 1300 hours, 28 March. He introduced himself and welcomed those in attendance. (A list of the attendees is provided at Enclosure 2.) After reviewing the LAM TF role in AE3 and its link to the Army's Strategic Communications Plan, he discussed and updated the agenda for the day. He then listed the items to be accomplished during this IPR:

- a. Review candidate experiments, technical plans, and dollars.
- b. Finalize experiments locations.
- c. Finalize theater story concept and players/scenario.
- d. Develop communications structure.
- e. Provide framework for follow-on educational products (CD ROM).
- f. Structure technical and scenario work groups.
- g. Break down equipment costs.
- h. Inform all participants of the AE3 web site (<http://204.7.227.75:443/AE3/>).
- I. Select future IPR dates.

3. LTC Brown highlighted and discussed significant points from the Concept Briefing that was presented on 22 March to LTG Dubia, the Director of the Army Staff. That briefing is on the AE3 Home Page.

4. Mr. George Jacques (Coleman Research) presented the Space and Strategic Defense Command (SSDC) plan (Enclosure 3) to show how information technology helps commanders visualize the battlefield/battle space: to demonstrate the FP TOC's Information Age Applications to plan, coordinate, and execute TMD and Force XXI operations, to demonstrate STOW technology's Training Value Added to synchronize and integrate combat power, and to demonstrate information age technology to enhance Mission Planning and Rehearsals, Course of Action Analysis, and After Action and Review Analysis. He was followed by Ms Dai Chu (MDBIC), who further elaborated on Theater Missile

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Defense aspects of the FP TOC and synthetic battlefield environment (Enclosure 4). MAJ Gammons (ARSPACE) continued with an explanation of proposed FP TOC connectivity and communications means (Enclosure 5). Ms Sharon Campbell (ARSPACE) then presented the capabilities and advantages of using the Global Broadcast Service (GBS) for data and voice transmission (Enclosure 6).

5. Mr. Allen Hardison (AMC) presented past and current uses of the Logistics Anchor Desk (LAD), including real-world applications of LAD capabilities (Enclosure 7). LTC Brown asked ARSPACE if this is a capability they need to "grow" in FP TOC. The answer was yes. The decision was made to have LAD participate as part of FP TOC and not as a separate stand-alone. Mr. Hardison will work with ARSPACE to incorporate the LAD as the logistics vehicle for the FP TOC.

6. MAJ Rick Burtnett (STRICOM) presented the Dismounted Infantryman concept, explaining what he wanted to have shown in the theater (Enclosure 8). He wants to portray the Land Warrior System.

7. Mr. Kelvin Nunn (MICOM) presented Telemaintenance/VMAT as a collection of technologies designed to aide in diagnoses and repair of weapon systems (Enclosure 9). He explained that application of these capabilities can be woven into the theater scenario and/or demonstrated with a wearable computer system displayed as a stand-alone.

8. Mr. Jim Pittman (Mitre w/TRAC) explained how Corps Level Computer Generated Forces (CLCGF) links virtual and constructive models with actual military systems in a synthetic environment where the warfighter/staff can step into the battle at any echelon to experiment, test, or train with new tactics, techniques, or procedures (Enclosure 10). He also informed the assembly about the Joint Virtual Experimentation Laboratory (JVL) that is being put together at Fort Leavenworth and addressed what will be available in time for AE3. He also presented an overview of the CLCGF architecture.

9. Mr. Bob Hatton (United Defense) presented a concept for Streamlined Acquisition (Enclosure 11) describing the process: its value, configuration, components, and communication links.

10. MAJ Larry Carpenter (APM Simulations and Training [Comanche]) presented his concept for AE3 (Enclosure 12) and discussed the Aviation Warfighting Cell.

11. Mr. Jim Calpin (Mitre) presented a briefing on Appliqué and the Tactical Internet (Enclosure 13). He suggested that Appliqué could be incorporated into the theater or set up as a stand-alone display, with the Tactical Internet functioning as its communications medium (as well as handling other traffic). An Army sponsor is yet to be identified.

12. Mr. Max Lorenzo (Night Vision Lab) demonstrated (via VHS tape) the

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types of night vision sensor effects that can be generated, then presented a capabilities briefing (Enclosure 14). These capabilities can be incorporated into the theater scenario, but night vision sensors will not be a stand-alone display.

13. Due to the lateness of the hour, LTC Brown quickly explained who should participate in the evening work group session, what the expectations were, and then at 1735 hours adjourned the formal session until the next morning.

14. The scenario integration work group met 1900-2125 hours Thursday evening, led by LTC Dave Tyner (LAM TF) and Mr. Mike Collins (Cubic). They used, as a jumping-off point for follow-on scenario development, the Concept Working Papers that were distributed to (placed on the tables of) all attendees at the start of the IPR (Enclosure 15).

15. LTC Brown reconvened the IPR at 0800 hours Friday morning and updated the agenda for the day, primarily presentation sequence changes. LTC Scott Fernald announced that there was a retinal display demonstration set up in the foyer and invited all to visit it during breaks.

16. MAJ Jim Vaglia (Army Research Lab) presented the Virtual Sand Table concept (Enclosure 16). This is a stand-alone 3D representation of the battlefield that can be used for mission planning and rehearsal or as a window into the current battle. Commanders can input through hand gestures and voice commands.

17. Mr. Dave Kearney (Texas Instruments) presented a candidate for the Advanced Tank Armored Simulator (Enclosure 17), a scout vehicle, explaining that the emphasis would be on the mission instead of the type of vehicle. Any vehicle type can be used, even a Humvee. The idea is to showcase the sensors. Although nominated as a stand-alone display, it can be readily imported into the theater scenario if so desired.

18. MAJ Don Renner (ODISC4) presented the Army Enterprise concept (Enclosure 18) to use the Army Global Command and Control System (AGCCS) as a common C4I thread. Army Enterprise will be a stand-alone displayed on the landing/foyer next to the Cotillion Ballroom in the Sheraton-Washington Hotel (AUSA convention site).

19. LTC Scott Fernald (LAM TF) presented his concept (Enclosure 19) for a stand-alone Countermine display consisting of an Infrared Mine Detection System designed to detect, identify, and classify mines through the use of an IR camera and processed through a parallel image processor, then displayed to the user using virtual retinal display technology.

20. LTC Neil Fay (Medical Advanced Technology Management Office) discussed the possibility of integrating MSC/P compatible Medical Situational Awareness and Control (MSAC) into the FP TOC. He also described several

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possible candidates for stand-alone TeleMedicine displays:

- a. MediTag and Medical Digital Assistant.
- b. Life Support for Trauma and Transport (LSTAT).
- c. Diagnostic Glove.
- d. MediCam.
- e. Man-Pack 3D Ultrasound.
- f. CareMed.
- g. Automated Laser Debridement.

21. Mr. Mike Collins presented the initial results of the Scenario Integration Working Group's evening session. At the conclusion of this briefing, LTC Brown said he would review the draft scenario (provided below) and adapt/adjust it to produce the final planning version. That version will be distributed with the agenda for the next IPR and attached as guidance for the Technical Working Group. The scenario developed at the evening session is as follows:

a. The Story Introduction: 3 Minutes

(1) Introduction - An historical example depicts how the increased speed and depth of the current battlefield requires decreased information transmission and coordination times and increased information accuracy. Proper application of technology allows us to increase the efficiency and effectiveness of our current force.

(2) Medium - Multimedia presentation with narration. No links required.

(3) Major Points:

(a) Minute 0-2:00 -- Narrator stresses why the Army is applying Information Technology. Compares past and current C2 and battlespace to 2010. Uses historical examples (GEN Griffith's discussion with Iraqi Division Commander or Lee at Gettysburg) to show the requirements for Information Technology in terms of time and effect. Must be able to execute quicker than the enemy can react.

(b) Minute 2:00-2:30 -- Stresses the importance of the synthetic environment as the medium for implementing information technology.

(c) Minute 2:30-3:00 -- Establishes the setting for transition to Military Operations - The Corps Fight. Telescope view of

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pieces of an overall scenario.

b. Vignette 1 -- Military Operations-Corps Deep Fight: 5 Minutes

(1) Depicts the application of technology to find critical enemy assets at multiple deep sites, to rapidly plan an attack with joint assets, to confirm target locations, to coordinate attack execution, to assess strike results, and to plan and coordinate restrikes. Compares this fight to a single target joint strike in Desert Storm in terms of time and effects.

(2) Medium - Central narration supported by distributed examples and multimedia. CLCGF is the simulation driver. Depicts how current experiments provide the necessary capability.

(3) Major Points:

(a) Minute 4-4:30 -- Narrator describes an ATACMS attack during Desert Storm using multimedia backup or CLCGF replication. It took 8 hours to detect, decide, deliver, and assess a single ATACMS strike to destroy one SA2 ADA site.

(b) Minute 4:30-5:30 -- JSTARS observing theater wide. Feeds going to Corps. JSTARS and SOF team spot and report enemy MRL unit movement to TOC (seen virtual, with Night Vision, video). TOC tasks deep recon Comanche to monitor and launches UAV (TOC shown in video clip, Comanche and UAV distributed, flying done in virtual).

(c) Minute 5:30-6:00 -- Comanche calls for fire on MRLs (Comanche on virtual and distributed). TOC clears target (Video clip). ATACMS fires (distributed from Fort Sill with video and photo backup). Enemy TEL launches deep (virtual and video). THAADs shoots down (virtual and distributed). Medical reacts to NBC threat (video).

(d) Minute 6:00-7:00 -- UAV arrives at MRL site for BDA (virtual and distributed). Sees destroyed vehicles, holes (dynamic terrain). UAV affected by weather. UAV and JSTARS spot and decides to restrike. Comanche and Apache Longbow launch to attack armored formation. JSTARS and UAV spot and report lead elements of an enemy armor formation. TOC decides to restrike. Air Force strikes deeper armored formations in coordination with attack helicopters.

(e) Minute 7:00-8:00 -- JSTARS and UAV assess damage. Transition to the Bde/DIV fight. Multiple successful coordinated deep strikes on multiple targets at multiple locations in the same 8 hours as 1991. Emphasize that example of UAV is in demo area and FP TOC, Comanche will be used in FP TOC.

(4) Nodes: Corps Combat Simulation Node (Fort Leavenworth)

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Communications/Integration Node (ARL)
TMD Simulation Node (ARC)

- (5) Linkages: Corps Combat Simulation Node and TMD
Simulation Node to Communications/
Integration Node
JVL (CLCGF, SOF), D&SABL (ATACMS) to Corps
Combat Simulation Node
Fort Bliss (THAAD), ARSPACE (Global Broadcast
System), AVTB (Comanche), JSTARS to
TMD Simulation Node
UAV, Air Force to Communications/Integration Node

c. Vignette 2 -- Military Operations - Bde Fight: 6 Minutes

(1) Depicts the application of technology to disseminate a DIV order and to plan, rehearse, and execute the order at BDE level in greatly reduced time. Shows the value of situational awareness and mission rehearsal in reacting to an enemy action during mission execution. Compares the time and effects of this operation to current operations.

(2) Medium - Centralized narration supported by distributed examples and multimedia. CLCGF is the simulation driver.

(3) Major Points:

(a) Minute 9:00-10:00 -- Narrator depicts an average of 24 hours to plan a brigade attack from receipt of division orders, through rehearsal to beginning the operation. With digitization, which results in common situational awareness, and simulation/visualization tools, this time can be reduced by at least half with significant increases in accuracy and quality of planning. Simulation and visualization tools will allow planners and decision-makers to train and fight using the same linkages, equipment, and procedures seamlessly. Bde receives Division order on MCS/P via Tactical Internet or GBS. Includes ops, Intel, logistics, air, air defense, engineer, and digital IPB. TOC sends to JVL. (Distributed and video)

(b) Minute 10:00-11:00 -- Bde Staff conducts decision-making process on MCS/P including course of action analysis and rehearsal (JVL distributed and video).

(c) Minute 11:00-12:00 -- Bde launches UAV. JSTARS and UAV spot enemy threat attacking village at NAI. Weather affects UAV. Bde Cdr decides to use planned rehearsed counter-attack option. (JSTARS, UAV distributed and video; Bde Cdr is video)

(d) Minute 12:00-13:30 -- Mechanized battalion counterattacks to block enemy (distributed virtual and video). Narrator

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highlights one unusual vehicle (United Defense vehicle). Platoon dismounts. PL C4I display shows common situation awareness. Dynamic terrain used in MOUT scenario. (All distributed, virtual and video) Soldier display shows his view in virtual and video. Comanche and Apache Longbow support infantry.

(e) Minute 13:30-14:00 -- Bde Cdr and staff monitor the battle's progress on A2C2S and use MCS/P to make plan changes before the enemy can act, which allows the Bde Cdr to force the enemy to do what the Bde Cdr wants the enemy to do. (Distributed and video)

(f) Minute 14:00-15:00 -- As the battle begins, medics use MEDI-TAG and MEDI-CAM to assist the evacuation and triage process. Emphasize MCS/P and UAV in FP TOC and UAV and MEDI-TAG/MEDI-CAM in demo area. Transitions to Post Operations. (video)

- (4) Nodes: Corps Combat Simulation Node (Fort Leavenworth)
Communications/Integration Node (ARL)
TMD Simulation Node (ARC)

- (5) Linkages: Corps Combat Simulation Node, TMD Simulation
Node to Communications/Integration Node
Marines and Medical to Communications/Integration
Node
JVL(CLCGF, MCS/P) to Corps Combat Simulation
Node
DBBL(PL C4I, Soldier display, Mech Bn, Dynamic
terrain), AVTB (Apache, A2C2S), GBS,
Tactical Internet to TMD Simulation Node

d. Vignette 3 -- Post Operations: 3 Minutes

(1) Depicts the use of battlefield data and digital technology to train units at home station, to educate individuals for future conflict, and to use simulations and battlefield data to simplify and improve combat developments.

(2) Medium - Centralized narration supported by distributed examples and multimedia.

(3) Major points:

(a) Minute 15:00-16:00 -- Students at TRADOC schools and combat developments analysts at TRADOC Battle Labs use battlefield digital data and rehearsal tools to study and wargame alternate courses of action (Distributed and video).

(b) Minute 16:00-18:00 -- Industry takes Army requirements documentation from analysis of battlefield digitization and establishes

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prototypes in computer software for simulation testing and verification before hardware prototypes are built, reducing acquisition time. Use United Defense's Combat System Integration Laboratory developed from AE I as an example. (Distributed and video)

- (4) Node: Corps Combat Simulation Node (Fort Leavenworth)
Communications/Integration Node (ARL)
Live Simulation Node (WSMR)
TMD Simulation Node (ARC)

- (5) Linkages: Corps Combat Simulation Node, Live Simulation
Node to Communications/Integration Node
D&SABL(rehearsal tools) to Corps Combat Simulation
Node
DBBL (rehearsal tools) to TMD Simulation Node (ARC)
United Defense lab to Live Simulation Node (WSMR)

e. The Story Summary: 2 Minutes

(1) Review of key points of the Story with emphasis on the prime and sub-messages.

(2) Medium - Multimedia presentation with narration.

(3) Major Points: Minute 18:00-20:00 -- The Army is spending it's modernization funding wisely and that funding should continue. Digitization improves the efficiency and effectiveness of the current force which increases the probability of battlefield success. "If I know where I am and I know where he is." Sensor to shooter links ~ time ~ weapon footprint. Information Technology improves decision-making and preparation for war

f. IDREN Nodes:

(1) Fort Leavenworth - Corps Combat Simulation Node: JVL, Depth and Simultaneous Attack Lab, Others

(2) White Sands Missile Range - Live Simulation Mode: Others

(3) Army Research Laboratory - Communications/Integration Mode: Sheraton Washington, Fort Belvoir, ARL, Other Services

(4) Advanced Research Center - Theater Missile Defense Simulation Node: Fort Bliss, Aviation Test Bed, ARSPACE, Dismounted Battle Lab, Other

22. Mr. Phil Dykstra (Army Research Lab) went over the Network finalization, listing IDREN nodes that already exist and the two to be added (AUSA site and JVL at Fort Leavenworth). He pointed out that the network was shown on the world wide web at <http://www.arl.mil/HPLMP/DREN>. There was

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much discussion about the ability of the network to handle such a big scenario with VTC and PDU's and whether T-1 links can handle the traffic.

More detailed information on actual requirements is needed before adjusting/down sizing the scenario or distribution plan.

23. At the conclusion of the discussions on scenario and communications architecture, LTC Brown addressed both issues and stated that he had all the groups input and would take that scenario, review, adjust, and adapt it as necessary, then publish it as a final document for the Technical Working Group to flesh out and develop the communications system architecture to support it. The scenario and communications architecture will be reviewed in final form at the next IPR.

24. LTC Brown explained the importance of each proponent's Technical Concept Plan and what it was used for. He requested that each proponent update its plan (based on information gleaned at this IPR) and get it to Ken Wren by close of business Friday (April 5). Preferred method is e-mail as an attachment or FTP.

25. Mr. Bob Edwards (Lockheed Martin) presented an overview of Lockheed Martin and its role in the ADST II contract (Enclosure 20). Its role in LAM TF and AE3 will grow as it evolves.

26. LTC Fernald introduced Mr. Don Steele (Coleman Research) who explained the requirements, guidance, and expectations (Enclosure 21) for the CD that this year will replace last years video, brochure, and display briefers. He reminded everyone that all input should be sent to him and that materials must be for public release. He also asked that components provide him a POC for their portion of the CD. He further asked that all applicable materials currently on hand should be sent to him no later than 19 April.

27. The next In-Process Review (IPR #4) will be held in the Sheraton Hotel, Orlando, Florida, starting at 1300 hours 23 April and ending at 1700 hours 24 April. This is a change from the location announced at the meeting. The Sheraton Hotel is located at the corner of Alafaya Road and E. Colonial Drive. The telephone number for the Sheraton is (407) 658-9008. Make your room reservations as soon as possible and tell the hotel that you are with the LAM TF group. IPR #5 will be conducted at Fort Leavenworth, commencing at 1300 hours 21 May and ending at 1200 hours 22 May. Further information and agenda for future IPR's will be distributed at a later date. The initial Technical Working Group will meet prior to the next IPR.

28. LTC Brown summarized the accomplishments of the IPR and answered all remaining questions. He stated that the minutes of this IPR would be distributed by next Friday (5 April). He then thanked all the participants for their hard work and contributions, closing the conference at 1120 hours, 29 March.

29. Copies of briefings (enclosures to these minutes) are not included for

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distribution (via fax and e-mail) with these minutes. Our first try at going paperless was not a complete success. These IPR minutes are being distributed via e-mail and fax with only the first two enclosures. The rest of the enclosures are or will be posted on the project homepage, linked to the original IPR minutes, as we work with you to get all of them. The various formats and paper only copies are hampering the effort. For those that didn't leave electronic files (in PowerPoint), please forward them to Ken Wren as soon as you can. In the interim, enclosures that do not contain the referenced briefing are so noted and the applicable POC annotated. Please contact the appropriate POC directly for additional information or copy of that particular briefing. The AE3 Home Page is at <http://204.7.227.75:443/AE3/>.

30. The following is a consolidated list of announced suspense dates/actions:

- a. 5 April -- Updated Technical Concept Plans to Ken Wren.
- b. 5 April -- Minutes for IPR #3 published and enclosures on the web.
- c. 5 April -- Technical Working Group meeting agenda published.
- d. 8 April -- Agenda for IPR #4 published.
- e. 19 April -- On-hand materials to Don Steele for CD consideration.

31. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

(s)

21 Enclosures Kirby R. Brown
 as LTC, QM
 1 and 2 are attached LAM Task Force
 3-21 are available on AE3 Home Page

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Enclosure 1
 Original IPR Agenda
 28 March (Thursday)

1250 Sign-in/settle-in/give briefing disk/paper copies to Ken Wren

1300 Welcome, admin announcements, and opening remarks LTC Brown

1310 Presentation/Discussion of concept briefing, LTC Brown
 CD ROM, and further development of vignettes

1430 Proponent presentations:

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| | |
|---|-------------------|
| Log Anchor Desk | Ms Kim Wright |
| WARLAB XXI | MAJ Birdwell |
| Dismounted Infantry/Dynamic Terrain | Mr Jan Chervenak |
| Combat STTAR | Mr George Rumford |
| Corps-Level Computer-Generated Forces | Mr Kent Pickett |
| Streamlined Acquisition | LTC Brown |
| Comanche/Apache LongBow | MAJ Carpenter |
| Appliqué/Tactical INTERNET | Mr Jim Calpin |
| Unmanned Aerial Vehicle | ARL |
| GBS/LEOCOMM | ARSPACE |
| 1650 Summary of days activities and assignment of Scenario Integration Working Group | LTC Brown |
| 1700 Adjourn general session for the day | |
| 1900 Scenario Integration Working Group session | LTC Tyner |
| 29 March (Friday) | |
| 0800 Stand-alone display presentations: | |
| Virtual Sand Table | ARL |
| Advanced Tank Artillery Simulator (ATAS) | Ms Chris Spiegl |
| Unmanned Aerial Vehicle | ARL |
| Tele-Maintenance/VMAT | Mr Kelvin Nunn |
| Army Enterprise | MAJ Renner |
| Mine Detection | LTC Fernald |
| Tele-Medicine | LTC Fay |
| FP TOC | ARSPACE |
| 0930 Network Finalization | Mr Phil Dykstra |
| 1000 Scenario Discussion | LTC Brown |
| 1030 Technical Concept Project Plan | LTC Brown |
| 1100 Lockheed Martin Overview | Mr Edwards |
| 1120 Summary and closing remarks | LTC Brown |
| 1200 Close | |

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SUBJECT: Minutes of In Process Review # 4 for Army Experiment III (AE3)

1. The fourth In Process Review (IPR#4) of Army Experiment III (AE3) was conducted 23-24 April 1996 at the Sheraton Hotel in Orlando, Florida. The IPR consisted of two sessions. The first session (1300 - 1700 hours, 23 April) addressed those experiments approved as "stand-alones" for on-site display at the October AUSA Convention and also the FP TOC (as a special on-site display). The second session (0830 - 1700 hours, 24 April) addressed those experiments that will be distributed (from remote locations; not on-site) to the AUSA Convention site and integrated into the theater presentation. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours. He welcomed the attendees and went over the updated agenda (Enclosure 2) for the first session, explaining the changes and the rationale for two sessions. He then explained that the purpose of the IPR was to lock down the various display components and to continue developing the scenario, transitioning to a final strawman.

3. Mr. Don Steele (Coleman Research) presented a briefing of how the CD ROM would be organized and operate (Enclosure 3). He stated that the CD would also include related references such as the Army Weapon Systems Handbook and the Army Modernization Plan. He also presented several tips for shooting digital video footage. LTC Brown reiterated how important the CD is because of its functionality in the future. It will be put on the World Wide Web and distributed to students at the service schools, CGSC, etc. CD development and production will not be managed on an IPR basis, but will be handled off-line. LTC's Fernald and Smart are overall in charge of this project.

4. A short break was taken while the meeting room was reconfigured to accommodate the one-on-one discussions. In addition to the individual proponent representative(s), the following individuals were present at each those discussions: LTC Brown (Project Manager), Mr. Ulf Helgesson (design), Mr. Joe Jennings and Mr. Jim Calpin (technical), Mr. Mike Collins (scenario), LTC Smart (CD ROM), Mr. Ken Wren (admin) and Mr. Bob Edwards and Mr. Steve Manzi (integration).

a. Virtual Sand Table (POC - MAJ Vaglia, Army Research Lab): Examined an updated concept plan. Discussed the need for 37" monitors and the possibility of having the TI Scout vehicle shown as an entity on the VST. It was decided that there would not be a head-mounted display used with the VST.

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b. Scout Vehicle (POC - Mr. Dave Kearney, Texas Instruments): Examined layout and discussed possibility of using Scout in scenario. If in scenario, it would be a separate simulator, not the stand-alone in the Cotillion Ballroom. It was recommended that the driver's seat be removed from the on-site simulator and the two gunner stations be represented as two separate vehicles.

c. Virtual Retinal Display (POC - Mr. A. J. Yarmie, Microvision): This is the replacement for the Mine Detection/Countermines display nomination (see Enclosure 4). Because he had concerns about the safety of retinal displays, LTC Brown asked that the concept be checked with either OSHA or Army Standards. Mr. Karl Ericksson (STRICOM) agreed to coordinate the safety issue.

d. Tele-Medicine (POC - LTC Neil Fay, MATMO): Discussed list of candidates and recommended priority for inclusion as displays. The candidates were: 1) MediTag and Medical Digital

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Assistant, 2) Life Support for Trauma and Transport (ASTAT), 3) The Diagnostic Glove, 4) MediCam, 5) Man-Pack 3D Ultrasound, and 6) CareMed. LTC Brown approved the top four and number five (Ultrasound) will be included if available (not in Bosnia field trial) and room can be found. The Personal Status Monitor (PSM) might be used in lieu of Ultrasound if space is reserved for the Ultrasound but it does not become available.

e. Virtual Maintainer (POC - Mr. Kelvin Nunn, MICOM Logistics Lab): This display will consist of a wearable computer with remote connection to a maintainer in a field location, weapons system diagnostics, and electronic field manuals (see Enclosure 5). The display will additionally include a virtual environment using 3D glasses and voice activated diagnostics procedures.

f. Force Projection (FP) Tactical Operations Center (TOC) (POC - MAJ Randy Cash, SSDC): Possible alternative on-site locations at the Sheraton-Washington were discussed. A site survey will be conducted in early May to identify any restrictions that may limit alternatives. The FP TOC will include a Logistics Anchor Desk and an Unmanned Aerial Vehicle control station. There could be a Global Broadcast Service (GBS) receiver located at the TOC, the SSDC display, and maybe at the Joint Virtual Experimentation Lab (JVEL) at Fort Leavenworth. Requirements of the SSDC, MD-BIC, and GBS Joint In-theater Injection (JITI) capability will be consolidated in an updated FP TOC Technical Concept Plan.

g. No one was present to represent the Unmanned Aerial Vehicle (UAV) display. The Army Enterprise display was previously coordinated and approved.

5. As this completed the first session, the IPR was recessed at 1700 hours until the second session started at 0830 hours the following morning.

6. LTC Brown opened the second session with a quick review of the purpose of the IPR and the revised agenda.

7. Mr. Mike Collins (Cubic Applications) presented a briefing of the latest version of the theater scenario and highlighted the changes made since last IPR (see Enclosure 6). The issue of the DACS-LM, 1 May 1996

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terrain box was discussed. Further action is required to ensure that all "players" will have access to the Korean terrain box. Mr. Collins showed the icon and entity counts throughout the scenarios. In response to the asked question, it was decided that both the Comanche and UAV would probably be used to conduct battle damage assessment.

8. Mr. Don Steele (Coleman Research) presented an encore briefing of the CD ROM project that he had presented the day before. The CD cut-off date is 1 August.

9. Mr. Joe Jennings (Mitre) briefed the results (see Enclosures 7 and 8) of the Technical Working Group meeting conducted 15-16 April. He explained what they wanted to accomplish and how they went about doing so. Mr. Bob Edwards (Lockheed Martin) explained the information required to integrate the various components. (He later provided a form to help participants identify those requirements. A copy of that form is at Enclosure 9.) Mr. Jennings continued with the technical plan to implement the three scenarios (vignettes). Timelines are still being worked. He reiterated that he is the POC for technical

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matters, Mr. Mike Collins is the POC for the scenario, and they will work together on parallel tracks. He then went over the communications plan and recommended/tentative test schedule:

| | |
|--------------|---|
| 20-21 May | Tech Working Group meeting |
| 24-28 Jun | ARL performance test w/DBBL |
| 1 Jul | ICD complete |
| 1 Aug | All IDREN sites operational |
| 5-9 Aug | Network load test (all sims) and data logging |
| 2-6 Sep | Theater set-up and test (Belvoir?) |
| 9-13 Sep | Distributed network testing and data logging; ARL |
| 8 Oct, 0600 | Start network installation at AUSA |
| 11 Oct, 0600 | All nets and sims in place and running for test and rehearsal |
| 13 Oct | Dress rehearsal |
| 14-16 Oct | AUSA, Washington DC |

10. After a short break, Mr. Jennings continued by addressing some of the questions raised during the break. He suggested that questions concerning communications be referred to Mr. Randy Kubic (Lockheed Martin) and Mr. John Ratzenberger (TRAC-Leavenworth) as they had a lot of expertise in multi-cast routing. He then clarified the scheduling requirements of IDREN versus the DSI. IDREN does not have to be formerly scheduled in advance, but those needing access to the IDREN via the DSI will have to be scheduled. He explained that the tentative test plan identifies only the major tests; other testing can and will be accomplished as required.

11. Mr. Randy Kubic introduced himself to the attendees and addressed the AUSA network issues and concerns. He is responsible for installation and administration of the network. He plans to set up a FTP file/server to make needed information more accessible. When this is set up it will replace the temporary one now in use (204.7.227.75/transfer/Brownk). When available, the new FTP site will be announced and access instructions published.

12. LTC Brown identified the control and administration team organized for the AE3 project. LTC Kirby Brown is the Project Manager/Leader. Lockheed Martin has ADST II responsibilities
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(technical integration, exhibit services, etc.). The CD ROM project is headed by LTC's Fernald and Smart, and technically managed by Mr. Don Steel. Mr. Ulf Helgesson is responsible for industrial design and Jason Novak (Mitre) is working with him on visualization and design. Mr. Mike Collins is the scenario story interface with Mr. Jennings and Mr. Calpin who are the technical representatives. Mr. Ken Wren is responsible for administration (scheduling, recordkeeping, web site, etc.).

13. LTC Brown discussed objectives to be accomplished over the next month:

- a. Technical Test Plan (POC - Mr. Bob Edwards).
- b. Video Teleconferencing Plan (POC - Mr. Bob Edwards).
- c. Stand-alone Displays draft design (POC - Mr. Ulf Helgesson).

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- d. Theater treatment (1st generation of story-board).
- e. 1st cut shot list schedule/data capture plan.
- f. All funding decisions finished and most funds disbursed.

14. The lunch break was taken early (1120-1230 hours) and the rest of the afternoon was devoted to one-on-one discussions with those proponents with experiments that will be distributed (from remote locations; not on-site) to the AUSA Convention site and integrated into the theater presentation:

a. FP TOC (POC - MAJ Cash, SSDC): Discussed the possibility of expanding or "exploding" the TOC layout to accommodate large groups (45-60 people). Consensus was that breaking the large group into two or more smaller groups and staggering the TOC presentation was not a viable alternative. MAJ Cash is to come back with his plan to handle large groups. The FP TOC Technical Concept Plan will incorporate/include the requirements of the Logistics Anchor Desk, the Unmanned Aerial Vehicle, the Depth and Simultaneous Attack Battle Lab, and GBS JITI. Need to determine if there are enough UAV stations to do everything. Need one each for the TOC and theater; the rest (2-4) in the stand-alone kiosk. MAJ Cash promised to give LTC Brown his priority list of "live" requirements NLT Monday, 29 April.

b. Dismounted Infantryman (POC - MAJ Burtnett, STRICOM): Discussed the Dismounted Battlespace Battle Lab (DBBL) concept to present the Land Warrior System. United Defense's "little ugly vehicle" (LUV) will also be shown in the Dismounted Infantryman portion of the scenario. DBBL is responsible for the single Technical Concept Plan that also includes the requirements of Dynamic Terrain (Army Research Lab) and the LUV (United Defense).

c. Streamlined Acquisition (POC - Mr. Bob Hatton, United Defense): Concept was presented and discussed with no major areas of concern.

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d. Corps Level Computer Generated Forces (CLCGF) (POC - Mr. John Ratzenberger, TRAC): Discussed how CLCGF would support the theater scenarios, the participation of the Joint Virtual Experimentation Lab (JVEL), and the requirement for a Command and Control Vehicle (C2V) mockup for use at the JVEL. TRAC is also examining the option of including a Mission Planning and Rehearsal Training System. The use of appliqué and/or Combat STTAR is still undecided. Mr. Joe Jennings agreed to research these areas and come back with an answer/recommendation.

e. Night Vision (POC - Mr. Max Lorenzo, CECOM): The sensors can support all scenario perspectives, but Mr. Lorenzo suggested that the scenario battles be fought at night to highlight the sensor capabilities. He will work with Mr. Ratzenberger to see what can be accommodated and with Mr. Collins for scenario fit.

f. Comanche/Apache Longbow (POC - Mr. Matt Arnold, PEO Aviation): All representatives were new to the project. The terrain database was discussed. After all related input from the other proponents is in, the decision will be announced as to which database will be used (National Training

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Center or Korea). The use of aviation assets in the theater scenario was discussed as well as the number of entities.

15. The IPR was concluded at 1700 hours.

16. The next AE3 IPR (IPR #5) is scheduled for 21-22 May, starting at 1300 hours on Tuesday and finishing at 1200 hours on Wednesday. There will be a Technical Working Group (TWG) meeting preceding the IPR. The TWG will start at 1300 hours Monday (20 May) and finish at 1200 hours Tuesday. Agendas will be published at a later date. Both meetings will be conducted at the Sheraton Hotel in Orlando, Florida. (The IPR was moved from Fort Leavenworth because of billeting shortage and traffic congestion.) The Sheraton Hotel is located at the corner of Alafaya Road and E. Colonial Drive. The telephone number for the Sheraton is (407) 658-9008. Make your room reservations as soon as possible and tell the hotel that you are with the STRICOM/LAM TF group.

17. POC for this action is LTC Brown. Recorder was Ken Wren, Cubic Applications, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

9 Enclosures
as

Kirby R. Brown
LTC, QM
LAM Task Force

DISTRIBUTION: Special via fax and e-mail

ENCLOSURE 1

Revised Agenda AE3 IPR #4

23 April (Tuesday)

| | |
|---|-------------------|
| 1250 Sign-in/settle-in/give disk/paper copies to Ken Wren | |
| 1300 Welcome, admin announcements, and opening remarks | LTC Brown |
| 1315 CD Update | Mr. Steele |
| 1330 One-on-one Proponent Reviews (in order): | |
| Virtual Sand Table | ARL |
| Scout Vehicle | Texas Instruments |
| Virtual Retinal Display | Microvision |
| Tele-Medicine | LTC Fay |

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Virtual Maintainer
FP TOC (on-site special)

AMC
ARSPACE

1700 Adjourn Tuesday's session

24 April (Wednesday)

0820 Sign-in/settle-in/give briefing disk/paper copies to Ken Wren

0830 Welcome, admin announcements, and
opening remarks LTC Brown

0900 Scenario Working Group report Mr. Collins

0930 CD Update Mr. Steele

1000 Technical Working Group report Mr. Jennings

1115 Integration Mr. Edwards

1130 Review of suspenses, next IPR schedule,
coordination, and milestones. LTC Brown

1200 Lunch

1300 One-on-one Proponent Reviews (in order):

| | |
|--|--------------|
| FP TOC - Distributed | SSDC |
| SBE | MD-BIC |
| LAD | AMC |
| GBS/LEOCOM | ARSPACE |
| Unmanned Aerial Vehicle | SIL |
| DSABL- ADOCS and Sims Support | D&SA Btl Lab |
| Dismounted Infantry with Dynamic Terrain | DBBL |
| Dynamic Terrain | ARL |
| Corps-Level Computer-Generated Forces | TRAC |
| Combat STTAR | WSMR |
| Night Vision | NVESD |
| Comanche/Apache LongBow | AVTB |
| Streamlined Acquisition | AMC/UDC |

1700 Tentative Close

ENCLOSURE 2

IPR Attendees

Arnold, Matt
Brown, Kirby LTC

PEO Aviation
LAM TF

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| | |
|----------------------|--------------------|
| Burnett, Rick MAJ | STRICOM |
| Calpin, Jim | Mitre |
| Campbell, Sharon | ARSPACE |
| Cash, Randy MAJ | SSDC |
| Chu, Dai | SSDC-MD BIC |
| Collins, Mike | Cubic Applications |
| Deaso, Robert | NVESD Fort Belvoir |
| Edwards, Bob | Lockheed Martin |
| Eriksson, Karl | STRICOM |
| Etcheverry, Mike CPT | AMC |
| Fay, Neil LTC | MATMO (USAMRMC) |
| Fernald, Scott LTC | LAM TF |
| Goins, Ray | Comanche (RAIL) |
| Hardison, Allen | AMC |
| Hatton, Bob | United Defense |
| Havicon, Robert | AEPCO/Apache PM |
| Helgesson, Ulf | IDA |
| Jacques, George | CRC w/SSDC |
| Jennings, Joe | Mitre |
| Kearney, David | Texas Instruments |
| Kubic, Randy | Lockheed Martin |
| Lorenzo, Max | CECOM NVESD |
| Manzi, Steve | Lockheed Martin |
| Neumann, Susan MAJ | HQ AMC |
| Novak, Jason | Mitre |
| Nunn, Kelvin | MICOM Log Lab |
| Pittman, Jim | Mitre w/TRAC |
| Ratzenberger, John | TRAC |
| Ridley, James H. | E Trp Comanche |
| Schmidt, Timothy | CRC w/ MD BIC |
| Smart, Thomas LTC | LAM TF |
| Smith, John | MICOM |
| Smith, Tom | STRICOM PM CAAN |
| Stallcup, Waymon CPT | ARSPACE |
| Steele, Don | CRC |
| Vaglia, James MAJ | ARL |
| Vandewart, Geoffrey | TSM Longbow |
| Wren, Ken | Cubic Applications |
| Yarmie, A. J. | Microvision |

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IPR #5**SUBJECT: Minutes of In Process Review # 5 for Army Experiment III (AE3)**

1. The fifth In Process Review (IPR#5) of Army Experiment III (AE3) was conducted 21-22 May 1996 at the Sheraton Hotel in Orlando, Florida. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours. He welcomed the attendees and updated them on actions that had transpired since the last IPR. AUSA has now agreed to allow the AE3 to use both halves of the Cotillion Ballroom for the exhibition. Current plan is to set up the FP TOC in the additional half. He then went over the planned agenda (Enclosure 2) and explained what each of the theater products consists of. He also presented and discussed the objectives for the IPR:

- a. Review Theater Products (scripts/storyboard/shot list)
- b. Complete/coordinate Theater Data Capture Plan
- c. Finalize Distributed Architecture and Simulations Support Plans
- d. Develop Video Teleconferencing Plan
- e. Review/coordinate Master Integration and Test Plan
- f. Decide on Theater Visualization System
- g. Update CD ROM status (timeline and suspense dates)
- h. Review updated Technical Concept Plans
- i. Review first draft Stand-alone Displays layout
- j. Plan future events/requirements.

2. LTC Brown went over the status of funds distribution. Those that still had funding issues were invited to discuss those issues off-line later that evening.

3. Mr. Joe Jennings introduced the report of results of the Technical Working Group (TWG) meeting that was conducted immediately preceding the IPR. He stated that the technical plans are all feasible and that there appear to be no unresolvable issues or "warstoppers." He explained that the addition of Battlefield Visualization, another TI Scout vehicle simulator to be located in Montana, and the Comanche simulator not being located on-site in DC are changes since the last IPR. He also suggested that to avoid possible confusion the phrase "real" or "real-time" be used

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in the future instead of "live." He then explained that he was amalgamating and reordering the original agenda items to facilitate presentation of the TWG results, providing a short overview of each agenda item and identifying the person who would present that issue.

a. Mr. Bob Edwards discussed the terrain data base. Korean terrain used in AE2 will also be the play box for this years effort, but with added features where possible for improved visualization. Mr. John Ratzenberger volunteered to review and select the best terrain in the play box that will support the scenario and yet can be improved the best/easiest, e.g. replacing 2-dimensional tree lines with 3-dimensional ones and texturing the terrain. To support TI Scout vehicle modeling, S-1000 was added to the database requirements identified to date. Mr. Edwards then presented his plan to obtain and distribute database data.

15 July was established as the target date to complete and distribute the data base. A base-line version will be distributed as soon as available and update/enhancements are finished. The experiment will be run on DIS version 2.0.4. Enumerations will be those defined in ModSAF version 2.1. The enumeration list was given to Ken Wren for posting to the AE3 FTP site for download by those that require it. (FTP to 204.7.227.75, log on as anonymous, go to sub-directory transfer, then to sub-directory brownk. The file is titled disconst.rdr and can be opened in MS Word.) LTC Brown asked Ken Wren to also acquire the ModSAF maps that Mr. Edwards identified as needed.

b. Ms Virginia To and Mr. Steve Manzi presented the communications plan and verified the distributed site listing (Enclosure 3). Ms To will pull together the communications package and meet (ARL, Lockheed Martin, and Mitre) next week in DC to develop a form on which to capture all participants' communication requirements. When that form is ready, it will be placed on the AE3 FTP site and all concerned will be notified of that action. Mr. Edwards is responsible for scheduling of the DSI. As soon as the network is up, informal capability testing will commence.

c. Mr. Ulf Helgesson presented his initial concept for the theater visualization consisting of three large screens (approximately 9'X7.5') and six smaller screens (at least 37"). All screens will be rear projection. The need for soundproofing of some kind was recognized.

d. Mr. Mike Collins summarized the status of the scenario. It will probably have to be shortened to bring it within the 20 minute target. LTC Brown reemphasized the importance of the theater script and the message it conveys. Mr. Collins later distributed the most recently updated copies of the script (Enclosure 4).

e. LTC Tom Smart presented and distributed the Theater Data Capture Plan explaining what it is and what it accomplishes. He needs the appropriate representatives to fill in portions of the plan, e.g., POC, location, shoot date, etc. The Data Capture Plan will be put on the AE3

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FTP site and also e-mailed to those concerned.

f. Mr. Bob Edwards presented the first-cut Master Integration and Test Plan. This document is at the schedule level, but the final document will cover the "how and what." There was a lengthy discussion of where (Orlando vs ARL/NRL) and when (August vs September) to conduct load testing.

4. LTC Brown explained the evenings schedule and his expectations for the round table working session that evening, then at 1640 hours adjourned the IPR until the next morning.

5. During the evening session (1900-2130 hours) Technical Concept Plans of those with distributed portions (theater participants) were examined. Issues discussed included:

a. FP TOC - Needs crane to lift shelters off vehicles and dollies to move them inside the Cotillion Ballroom. Can run off 110 voltage for everything except the UAV, which needs 220 volts. FP TOC Technical Concept Plan will be updated to also include the power requirements of SSDC, UAV, and GBS (if participating). Mr. Helgesson will visit the FP TOC set up at Fort Bliss during Roving Sands exercise on 5-6 June. There are no conflicts with the theater scenario.

b. UAV - Needs two IP addresses for ONYX drivers.

c. Brigade and Battalion vignette - Added a second TI Scout Simulator (Bn Cdr's C2V). Joint Virtual Experimentation Lab (JVL) will run the staff drill (Course of Action/Rehearsal tool simulation or Battlefield Visualization Product (BVP). It was suggested that the C2V players be seasoned people, maybe past commanders. JVL will orchestrate the Comanche in ITEMS.

c. Dismounted Infantryman/Dynamic Terrain - Dynamic terrain will be highlighted at the end of the dismounted scenario when soldiers are clearing/moving through the village. Major concern was the switching from one CIG to another (NPSNet vs ARL).

6. The IPR reconvened at 0800 hours, Wednesday.

7. Mr. Bob Edwards summarized the changes (made during his Tuesday presentation) to the Master Integration and Test Plan. The revised schedule is shown below.

Definitization 5/22/96

- Theater Definitization 5/22/96
- Scenario Definitization 5/22/96
- Story Board 5/22/96
- Shot List 5/22/96

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- Exhibit Floor Allocation Decision 5/22/96
- Development 5/23/96 - 8/21/96
 - Sub Systems (Participants) 5/23/96 - 8/2/96
 - Ballroom Floor Plan 5/23/96 - 6/12/96
 - Theater (AV/Mech/Stealth) 5/23/96 - 8/21/96
 - Collect Database Source 5/23/96 - 7/12/96
 - Distribute Database to Participants 7/15/96
 - VTC Subsystem 5/23/96 - 7/17/96
 - LHN Sub System 5/23/96 - 7/31/96
- IDREN Network Testing 8/5/96 - 8/9/96
 - Multicast 8/5/96 - 8/6/96
 - Load 8/7/96 - 8/9/96
- Interim Testing (Orlando) 8/19/96 - 10/8/96
 - Orlando OSF Preparation 8/19/96 - 9/5/96
 - 10 MB Connection to Orlando 8/19/96
 - 10 MB Stand-Alone Testing 8/20/96 - 8/29/96
 - Install Integrate Theater, Stealth 9/2/96 - 9/5/96
 - Install Integrate SAFOR 9/5/96
 - Integrate Long-Haul Participants 8/30/96 - 10/8/96
 - Fort Benning - DBBL 8/30/96 - 9/2/96
 - Fort Leavenworth - TRAC 8/30/96 - 9/2/96
 - Helena, MT - Texas Instruments 8/30/96 - 9/2/96
 - San Jose - United Defense 9/3/96 - 9/5/96
 - Fort Bliss 9/3/96 - 9/5/96
 - Fort Sill 9/3/96 - 9/5/96
 - Huntsville - SSDC 9/3/96 - 9/5/96
 - Network Testing 9/6/96 - 9/11/96
 - Broadcast 9/6/96 - 9/9/96
 - Appearance 9/10/96 - 9/11/96
 - Survivability/Lethality 9/10/96 - 9/11/96
 - Scenario Tuning 9/12/96 - 9/18/96
 - Mission Rehearsal 9/19/96 - 10/2/96
 - Pack and Ship to Show 10/3/96 - 10/8/96
- AE3 Integration 10/9/96 - 10/18/96
 - Setup for AUSA 10/9/96 - 10/10/96
 - Dress Rehearsal 10/11/96 - 10/13/96
 - AUSA Demo/AE3 Experiment 10/14/96 - 10/16/96
 - Teardown 10/17/96 - 10/18/96

8. Proponents with Stand-Alone displays presented status briefings and updated/verified their equipment and power requirements:

a. Virtual Sand Table (MAJ Vaglia) - Everything is on track and no problems are expected. CD ROM still needs working. Need four more sets of Crystal Eyes glasses.

b. Scout Vehicle (Mr. Jim King) - Presented layout and typical (stand-alone) scenario. One of the four simulators in Helena, Montana will be integrated in the theater scenario. Another simulator might be

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available to integrate into the FP TOC scenario. MAJ Gammons will coordinate this inclusion if it becomes a reality. Decision will be made by next IPR.

c. UAV (Mr. Ralph Burkhardt) - Will provide "total" concept plan that also includes the integrated requirements. Still needs to work the CD ROM requirements.

d. Virtual Maintainer (Mr. Kelvin Nunn) - Everything on track.

e. Army Enterprise (MAJ Don Renner) - No problems anticipated. Updated actions and issues ongoing. Went over internal schedule of events/tests in preparation for AUSA exhibit.

f. Virtual Retinal Display (Mr. Mark Schulz) - Presented concept briefing and asked for assistance to ensure his scenario was doctrinally sound. LTC Dave Tyner will assist with the scenario.

9. LTC Brown explained that the support programmatics (including equipment) is to make requirements known via the Technical Concept Plan, identify them for inclusion in Mr. Helgesson's design sketches (which will then be codified as the Lockheed Martin Engineering and Integration Plan), and also to update requirements as appropriate at each IPR.

10. Mr. Don Steele discussed the status of the CD ROM. We have not completed the first phase of his three phased plan, but have already moved ahead into the second phase. "Source" material (originals) are now needed. He reminded the attendees that the final input cutoff date is still 19 July. LTC Brown again emphasized the importance of the CD as it replaces the video, canned speeches, and brochure used last year.

11. Mr. Ken Wren explained that hotel room reservations are an organizational responsibility this year and distributed a list of hotels/telephone numbers to assist in finding lodging. He suggested that proximity to a subway station should be a major factor when selecting a hotel. The Sheraton-Washington Hotel (AUSA Convention site) is next to the Woodley Park Zoo subway station and that parking is seldom available and usually very expensive. Room reservations should accommodate the following planning dates: Set up starts 9 October; rehearsals start 12 October; exhibition is 14-15 Oct; and teardown/ship equipment 17-18 October. He then explained that requirements for uniformed soldiers to assist/participate in the exhibit should be submitted to him NLT 1 July for consolidation and eventual submission to ODCSOPS. (LTC Brown reminded everyone that they had a responsibility to adequately prepare any soldiers they employ. This includes briefing them about what to expect when TDY to the DC area and fiscal common sense.) The following information is required when requesting soldiers:

a. Personnel required (including NCOIC if desired), by component, rank,

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and MOS (and simulator used, if applicable)

b. When and where required (include any testing and rehearsals)

c. Uniform/equipment requirements

d. (if known) Providing unit/soldier names and providing unit POC and RM POC

e. Your AE3 POC

12. LTC Scott Fernald presented a briefing (Enclosure 5) on the Army Strategic Communications Plan and explained the importance of the targeted audience and making sure that AE3 is linked to Task Force XXI.

13. LTC Brown then solicited comments and opened the forum to general questions and discussions. Issues discussed included:

a. LTC Brown stressed the need to ensure continuity of component POCs (primary/technical). He asked if anyone objected to putting the POC roster on the web site and received no negative response; therefore, the roster will be added to the AE3 home page.

b. Attendees should start thinking about any lightboards that may be required. This will be an agenda item at the next IPR.

c. Everyone was asked to provide an up-to-date Technical Concept Plan to Ken Wren by Friday, 31 May. These will be posted on the FTP site and should be kept updated by the proponents.

d. Entity counts for the scenario are due to Mr. Bob Edwards, copy to Mr. Steve Manzi, NLT 31 May.

e. Uniforms for soldiers at the AUSA exhibit will be the BDU.

f. Decision was announced that all should plan for full blown testing to be conducted at the ARL facility in DC during the last two weeks of September, subject to inspection of the facility and determination of its capabilities.

14. The next In Process Review (IPR #6) will be conducted in Colorado Springs, 20-21 June. Meeting will start at 1300 hours on Thursday and finish at 1200 hours Friday.

a. Twenty-five government-rate rooms have been blocked at the in the Holiday Inn Express, (719) 591-6000 (ask for Sharon Creighton and tell her you are attending the LAM TF conference at ARINC). These rooms are blocked only until 10 June, so make haste if you want one. Directions to the hotel from the airport: Turn right (north) on Powers Boulevard at

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first stop light upon exiting the airport. Turn left (west) on Fountain Boulevard at second stop light. Turn left (south) on AeroPlaza Drive at first stop light. Holiday Inn Express entrance located on the immediate left after turning onto AeroPlaza Drive.

b. The meeting will be held at the main conference room at the ARINC facility, 1925 AeroTech Drive, Suite 212. ARINC is east of the Holiday Inn Express, across an empty field.

15. The following planning dates and locations were tentatively established for future IPRs (as needed):

IPR #7 - 23/24 July at Fort Leavenworth, Kansas

IPR #8 - 27/28 August at Washington, DC

IPR #9 - 24/25 September at Orlando, Florida

16. LTC Brown thanked everyone for their efforts and closed the IPR at 1125 hours.

17. Only Enclosures 1 and 2 are attached. Enclosures 3 through 5 will be posted on the project home page, linked to these IPR minutes. The AE3 Home Page is at <http://204.7.227.75:443/AE3/>.

18. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

ENCLOSURE 2

Planned Agenda

1300 hrs, 20 May - 1200 hrs, 21 May Technical Working Group Meeting

21 May (Tuesday)

1250 Sign-in/settle-in/give copies of updated Concept Plan to Ken Wren

1300 Welcome, admin announcements, and
opening remarks LTC Brown

1310 Status of Participants and Funding LTC Brown

1320 Terrain and Other Databases Mr. Jennings

1330 Theater Distributed Architecture/
Communications Plan Mr. Jennings

1400 Theater Visualization System Plan Mr. Helgesson/Mr. Novak

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1420 Theater Products Mr. Collins

1500 Theater Data Capture Plan LTC Fernald/LTC Smart

1530 Video Teleconferencing Plan Mr. Edwards

1600 Integration and Test Plan Mr. Edwards

1650 Summary of days accomplishments and plans/guidance
for the following morning's session LTC Brown

1700 Adjourn Tuesday's formal IPR session LTC Brown

1900-2100 Round-table working session (distributed portions) LTC Brown

22 May (Wednesday)

0800 Admin announcements/agenda update LTC Brown

0810 Stand-alone Display Update Briefings(in turn):

Virtual Sand Table

Scout Vehicle

Unmanned Aerial Vehicle

Virtual Maintainer

Army Enterprise

Tele-Medicine

Virtual Retinal Display

FP TOC (on-site display)

1020 Stand-alone Displays Design Mr. Helgesson

1035 CD ROM Update Mr. Steele

1050 Soldier Support/Billeting Requirements Ken Wren

1100 Open discussion of general issues LTC Brown

1130 Review of suspenses, next IPR schedule,
coordination, and milestones. LTC Brown

1150 Summary and closing remarks LTC Brown

1200 Close

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IPR #6**SUBJECT: Minutes of In Process Review # 6 for Army Experiment III (AE3)**

1. The sixth In Process Review (IPR#6) of Army Experiment III (AE3) was conducted 20-21 June 1996 at ARINC in Colorado Springs, Colorado. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 1300 hours, thanking ARINC for allowing us to use their facility. He introduced himself to the new attendees and welcomed all attendees to the meeting. He stated that the primary goal of this IPR was to continue cross-checking component plans and requirements against the master plan.

3. Mr. Ken Overturf (ARINC) gave administrative announcements (locations of phones, bathrooms, smoking area, copy machine, etc.)

4. LTC Brown then went over the following IPR objectives:

- a. Review layout of Cotillion Ballroom
- b. Cross-check that all stand-alones and on-site exhibits are integrated.
- c. Verify and consolidate all technical requirements, capturing accurate scope of work for exhibition construction.
- d. Review IDREN laydown and cross-check requirements. Fix suspense dates for due outs.
- e. Review status of theater products and cross-check data capture plan.
- f. Review project master timeline and the first draft of the integration master plan.
- g. Review updated/final technical concept plans.
- h. CD ROM laydown. Cross-check data capture plan.

5. Mr. Ulf Helgesson presented a laydown of the Cotillion Ballroom. He explained the rationale of the layout, the traffic flows, and "escape" plans. There will be three main areas: the midway (consisting of stand-alones), the theater, and the TOC. Final layout is dependent on the TOC layout (decision was announced on 21 June). He also discussed areas for location of support electronics. Working together, Ulf controls the layout of the ballroom and Lockheed Martin sorts out what goes behind the wall (support electronics). Once the layout is

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finalized, a copy will be posted to the AE3 Homepage.

6. Mr. Randy Noble presented the Theater Visualization Plan. He covered theater control, video sources, audio sources, live feed (VTC), projection staging, audio staging, and lighting. There was a lengthy discussion of how to handle losses of feeds or resynchronization because of audience questions, etc. During train up, everyone needs to prepare for interruptions - run battle drills. Decision was made that there would be a 3X3 screen configuration and five VTC sites. The distributed VTC sites are now:

- a. United Defense - San Jose, CA
- b. Dismounted Battlespace Battle Lab - Fort Benning, GA
- c. SIMITAR - Bozeman, MT
- d. RTOS - Fort Bliss, TX
- e. Joint Virtual Laboratory (JVL) - Fort Leavenworth, KS

7. Mr. Don Steele (CRC) presented an update on the CD ROM. He went through a rough draft to illustrate contents and structure. LTC Brown asked that the FP TOC not be listed as a stand-alone, but separately.

This results in three experiment groups: stand-alone, distributed, and FP TOC. A button needs to be added to allow viewers to skip to that area or subject they are most interested in. The CD cover will be sorted out soon; it will probably be the same as the main screen on the CD. The Secretary of the Army will be asked to add comments/provide an interview. Need to add in Force XXI and AWEs as a section in the CD for information purposes (Army Strategic Communications Plan).

8. LTC Tom Smart distributed copies of the Data Capture Plan to those directly involved. He asked that all review and any comments or recommendations be made as soon as possible. He announced a meeting to be held that evening with Mr. Dennis Reeder, Mr. Bob Edwards, Mr. Randy Noble, Mr. Jim Calpin, and any other interested party to ensure the capture dates are sufficient and coordinated.

9. Mr. Bob Edwards (Lockheed Martin) presented the Master Integration and Test Plan. He went over the distributed theater components and had each participant confirm/change requirements. He then went over the stand-alone components. Mr. Edwards, Ms. Ginny To, and Mr. Joe Jennings are to determine exact contents of the test plan. LTC Brown stated that a published plan is due at the next IPR. Major test events are:

- a. IDREN Network Testing (Long Haul) at Aberdeen, MD, 5 - 9 August.
- b. Interim System Testing at Orlando OSF, Orlando, FL, 19 August - 11

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September.

c. System Test and rehearsal at Aberdeen, MD, 18 September - 8 October.

d. AUSA Integration at Washington D. C., 9 - 11 October.

e. AUSA rehearsal and execution at Washington D. C., 12 - 16 October.

10. Stand-alone displays were reviewed, including Technical Concept Plans and Concept Briefings, lightboard standards, and power and equipment requirements. Mr. Helgesson, Mr. Kubik, and Mr. Manzi audited power and equipment requirements.

a. Virtual Sand Table (MAJ Jim Vaglia): Concerns about metal and lighting were addressed and resolved. LTC Brown asked MAJ Vaglia to contact him the week of 28 June reference a possible source for CrystalEyes. LTC Brown asked Lockheed Martin to clean and refurbish all old lightboards.

b. Scout Vehicle (Mr. Dave Kearney/Mr. John Wasson): There needs to be two separate projects - the scout vehicle simulator in the ballroom will be referred to as the Scout Vehicle project while the scout vehicle simulator in Bozeman, MT, will be referred to as the SIMITAR project. Separate updated Technical Concept Plans were provided by Mr. Jim King during the meeting. Texas Instruments is providing their own simulator infrastructure and Lockheed Martin will provide partition, tables, and chairs.

c. Unmanned Aerial Vehicle (Mr. Ralph Burkhardt): An updated Concept Briefing is required. The UAV briefing should explain that TCSS (Tactical Control System Surrogate) is a joint Army/Navy program and the Predator is AF/Army. LTC Brown agreed to video tape/data log the theater piece - the issue is when to tape the video due to UAV's schedule. Mr. Collins agreed to look at reweaving the UAV in script item 46 (both video and words).

d. Virtual Maintainer (Mr. Kelvin Nunn): Provided updated Tech Plan.

e. Army Enterprise (LTC Pat McNiece): Provided new concept. Changes in design and equipment require redo of all specifications. MAJ Renner is to contact Mr. Helgesson and work through the redesign no later than 28 June.

f. Virtual Retinal Display (Mr. Mark Schulz): On track - no significant concerns.

g. Force Projection TOC (MAJ Al Gammons): Concept briefing and Technical Concept Plan, including UAV power and equipment requirements,

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is due 3 July. Issue concerning classification of ASAS was surfaced. Decision was made to go with the TOC design worked out in El Paso. Agreement was reached that previously paid funds to SSDC would be drawn down to pay for exhibit construction and theater electronics. Requirements were given to Mr. Helgesson and Mr. Randy Noble for separate costing and inclusion in overall packages.

11. The regular IPR session was adjourned for the day at 1930 hours.

12. A special work session for Dismounted Infantry was convened in a meeting room at the Holiday Inn Express, 2000 - 2130 hours. MAJ Burtnett is to analyze his budget to determine if the planned DBBL participation can be accomplished with the funds allocated and report back to LTC Brown NLT 3 July.

a. CPT Ed Jennings (BBCL) presented and discussed a new script for the dismounted infantry portion of the theater.

b. MAJ Rick Burtnett (STRICOM) promised to provide the MOUT database to Ms. Ginny To (ARL) for her use in the Dynamic Terrain portion.

c. Mr. Paul Barham (NPS) promised a copy of the Dismounted Infantry Soldier model to Ms. To by 4 July.

d. Agreement was reached on simulation courses of action. Updated consolidated Technical Plan is due to Mr. Wren NLT 28 June.

e. A scenario terrain database work group will meet in conjunction with the Joint Virtual Laboratory (JVL) visit and meeting on 17 July (see paragraph 15b below).

13. The IPR was reconvened at 0730 hours, Friday 21 June. LTC Brown reordered the agenda sequence for the day then discussed the next IPR. The next In Process Review (IPR #7) will be conducted at Fort Leavenworth, Kansas, 18-19 July. Meeting will start at 0900 hours on Thursday and finish at 1200 hours Friday. Detailed information and planned agenda will be provided in a separate correspondence (NLT 28 June).

14. Mr. Mike Collins updated the status of the theater script. He passed out copies, explaining that the left side (shot list) is locked in, but the right side (narrative) is still being "tweaked." The script should match the capture plan; everyone was asked to make sure there are no disconnects. The use of the term "2010" versus "21st Century" was discussed. Minor word changes were discussed during the break.

15. Distributed components were reviewed, including Technical Concept Plans and Concept Briefings, lightboard standards, and power and equipment requirements. Mr. Helgesson, Mr. Kubik, and Mr. Manzi audited

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power and equipment requirements.

a. Force Projection TOC Synthetic Battlefield Environment (Mr. Dan Fugit): One all inclusive Technical Concept Plan will be submitted by 3 July. Went over layout and updated lightboard plan. LTC Brown disapproved the TOC lightboards. Technical requirements were verified with Lockheed Martin and power requirements were identified. A second Bozeman SIMITAR simulator was added to the connectivity plan. Went over the communications architecture. Security of classified systems is an area of concern and will require some firewalls and sanitation of data.

FP TOC will integrate its test plan with the master test plan. Mr. Edwards will have terrain files ready for distribution NLT 15 July.

Agreement on aviation simulation (ITEMS) was reached between Mr. Arnold and Mr. Fugit. Mr. Arnold will provide the software and Mr. Fugit will provide the hardware platforms.

b. Corps Level Computer Generated Forces (CLCGF) (Mr. Jim Pittman): Discussed status of Joint Virtual Lab (JVL) set up and operational capabilities. SIMITAR needs to send people to Leavenworth for MCS/P and ASAS training. Need dummy SINCGARS for C2V mockup. VTC will be leased.

Soldiers to populate the C2V are still a requirement. Chorwan terrain will be used. Need to look at the number of entities to ensure there are enough for realism of FP TOC play. The possible need was recognized for a "target" meeting and JVL visit (Fort Leavenworth) before the next IPR.

This meeting/visit is tentatively scheduled to start at 1500 hours on Wednesday, 17 July. Details will be provided with the agenda for IPR #7.

c. Streamlined Acquisition (Mr. Bob Hatton): Has all required models and database and will play in vignettes #2 and #3. Scenario input is due to Mr. Mike Collins NLT 25 June.

d. Night Vision (Mr. Max Lorenzo): At issue was comparison of virtual versus thermal view. Terrain enhancements will be decided as soon as the threat laydown is designated. Mr. Pittman/Mr. Ratzenberger will sort out details of the threat laydown for the next IPR in conjunction with the "target" meeting mentioned above. Mr. Matt Arnold (PEO Aviation) will work with Mr. Lorenzo to determine the location of the special operations site.

e. Log Anchor Desk (Mr. Allen Hardison): No technical problems. Don't need VTC from LAD at AMC HQ - will use video capture of screens and filmed "talking head."

f. Simulation in training for Advanced Readiness (SIMITAR) (Mr. John Wasson): Working on ISDN line at Bozeman, MT. Other options are being examined. Need software and training for MCS/P. Mr. Pittman will coordinate software and equipment and Mr. Wren will coordinate with BCBL for the training.

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g. Dismounted Battlespace Battle Lab/Dynamic Terrain (DBBL/DT) (MAJ Rick Burtnett/Ms. Ginny To): Consolidated Technical Concept Plan is due 28 June. Discussed scenario changes and technical requirements.

Timeline was coordinated. Some theater screens may be used for supporting diagrams, text, etc. ARL needs a person in the Cotillion Ballroom to manage ARL on-site equipment unless other arrangements are worked out with Lockheed Martin.

16. Communications Architecture Plan: Mr. Bob Edwards collected and confirmed database source requirements. Mr. Joe Jennings updated efforts to finalize the Communications Plan. Ms. To went over physical connectivity nodes (DSI links) in use by the theater and the Logical Connectivity diagram. DBBL and ARC need to determine if T1 lines will be sufficient. Two issues remain to be resolved: 1) DBBL bandwidth, and 2) VTC meeting on Thursday, 27 June, to resolve connectivity of ARC to SSDC. Mr. Manzi will distribute information on this meeting. Meeting results are to be provided to LTC Brown on 28 June.

17. There will be twelve (12) lightboards located in the Cotillion Ballroom. Lightboards will be standardized with a headline/title (2 or 3 words) across the top with up to 4 subordinate bullets (maximum of 8 words each). The area below this will be divided (side by side) between the text body (maximum 120 word paragraph) and the graphic (roughly 4X5 proportion, 5 being the height). Distribution of lightboards is as follows:

- a. Army Enterprise - 2
- b. Virtual Sand Table - 1
- c. Scout Vehicle - 1
- d. Virtual Retinal Display - 1
- e. Tele-Medicine - 2
- f. Unmanned Aerial Vehicle - 1
- g. Virtual Maintainer - 1
- h. Theater queuing area - 1
- i. Cotillion Ballroom (general) - 2

18. The meeting was opened for general discussion and questions. There being no further business, LTC Brown thanked everyone for their efforts and closed the IPR at 1145 hours, reminding everyone that the next IPR will be at Fort Leavenworth, KS, on the 18th and 19th of July.

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19. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil.

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IPR #7**SUBJECT: Minutes of In Process Review #7 for Army Experiment III**

1. The seventh In Process Review (IPR #7) of Army Experiment III (AE3) was conducted 18-19 July 1996 at Eisenhower Hall at Fort Leavenworth, Kansas. A list of attendees is at Enclosure 1.

2. LTC Kirby Brown opened the conference at 0900 hours , 18 June, and welcomed all attendees to the meeting. He then went over the following IPR objectives:

- a. Confirm that all requirements are captured.
- b. Confirm that all component plans are complete.
- c. Confirm that all databases have been distributed.
- d. Confirm that all pending actions are coordinated.
- e. Finalize the Cotillion Ballroom layout.
- f. Finalize the Communications Architecture Plan.
- g. Finalize the Integration Master Plan and Timeline.
- h. Finalize the theater script.

2. Mr. Ulf Helgesson presented an updated laydown of the Cotillion Ballroom.

3. Mr. Phil Dykstra presented the Communications Architecture Plan. He stated that moving the testing to Orlando from ARL carries a little more risk. Mr. Dykstra and LTC Geddes will work the issue of a router purchase for UDP. A tour of DSI sites will be set up. Some sites still have not provided needed data (IP addresses, machines used, etc.)

4. Lockheed Martin representatives went over requirements and the Integration Master Plan. Mr. Steve Manzi defined the integration requirements of the theater, the FP TOC, and the stand-alone exhibits for the Long Haul and OSF tests and AE3 execution. He briefed the new dates and location for integration testing:

- a. IDREN Test, Aug 1 - 30, Local to Sites from ARL.
- b. Long Haul Testing, Aug 30 - Sep 11, Local to Sites from Orlando OSF.

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- c. System Test, Sep 12 - Oct 3, Local w/ Participants at OSF.
 - d. AUSA, Oct 9 - 17, Sheraton in D.C.
5. Mr. Manzi went over each proponent to verify dates and required events, equipment, and personnel. He also covered IG application host information (RAM and texture memory) requirements, database source requirements, and a database source requirements matrix.
6. Mr. Randy Kubik briefed the LAN (theater subnet).
7. Mr. Manzi discussed the shipping and move-in schedule. An updated version of that schedule/marking instructions is at Enclosure 2. LTC Brown made a decision to use consolidated shipping point for flow control into the Sheraton hotel. A more detailed movement plan will be published before the next IPR.
8. Mr. Randy Noble presented the theater visualization plan. He addressed theater hardware, control and source hardware, and video sources. He went over the VTC sites and system requirements. He then covered the same areas for the FP TOC.
9. Mr. Joe Jennings explained that the communications plan was not yet final as all requirements had not been validated. He stated that all requirements would be checked and verified during the round-robin check the following morning.
10. Mr. Mike Collins presented the theater script and storyboard and explained their relationship with the data capture plan. He then conducted an event-by-event walk-through of the storyboard as LTC Smart cross referenced the data capture plan and the script participants verified its accuracy or recommended changes. The updated script and data capture plan are now on the FTP site (204.7.227.75) as files 24JULscript.doc and 24JULdcp.xls, respectively.
11. Mr. Don Steele showed a beta version of the CD ROM, explaining its organization, giving examples of content, and showcasing its capabilities and search engine.
12. Due to the lateness of the hour, LTC Brown announced that the FP TOC presentation would be conducted as a special evening session. He then adjourned the regular IPR session for the day.
13. The evening session convened at 1730 hours in Wagner Hall. LTC Brown reviewed the FP TOC concept and discussed issues involved in the testing and setup of the TOC. Only those few items required for the testing at OSF will be shipped to Orlando. It was agreed that Lockheed Martin would ship the TOC from Huntsville to the AUSA convention and back. It was also agreed that integration testing would be from

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Huntsville and a consolidated shipment package would be used.

14. LTC Brown reconvened the IPR at 0800 hours, Friday, 19 June. He summarized the accomplishments of the prior day and went over the agenda for the second day's activities. He informed the group that the Masters of Ceremony for the theater will be LTC Phillip Macklin, LTC Neil Fay, MAJ Shiela Taylor, and CPT Ed Jennings. He also announced the new e-mail addresses for himself, Mike Collins, and Ken Wren that will go into effect on 30 July:

a. LTC Kirby Brown -- brownk@leav-emh1.army.mil

b. Mike Collins -- collinsm@leav-emh1.army.mil

c. Ken Wren -- wrenk@leav-emh1.army.mil

15. Mr. John Ratzenberger presented the threat laydown, identifying the terrain locations upon which the scenario events would be played.

16. Mr. Ken Wren requested that all agencies provide (via e-mail) a list of anticipated AUSA attendees NLT 1 August. Final changes and additions must be submitted NLT 1 September. Ken will submit consolidated list of names to AUSA, obtain completed exhibitor badges, and distribute them at the Cotillion Ballroom during setup. Required information is: Rank/Title, First Name, Last Name, and Organization. He then discussed identified requirements for uniformed soldiers and training of those soldiers. CPT Jones (BPV) may be able to provide an ASAS operator to the JVL. A minimum of four more soldiers are required by the JVL. There is a requirement for ten (10) individuals to receive MCS/P training: two from Bozeman (SIMITAR), two from Texas Instruments, the four operating at the JVL, and two TRAC personnel. Training is needed on MCS/P Beta version, not the baseline version.

17. A Memorandum of Instruction for the completion of the AUSA '96 After Action Report was distributed. (The last sentence in the first paragraph of the MOI should be corrected to read "Suspense ... is 28 October, 1996." The "18" is a typo.) Selected individuals responsible for submission of annexes and/or appendices were identified/verified:

Annex C: Army Enterprise - MAJ Renner

Annex D: Streamlined Acquisition - Bob Hatton

Annex E: Land Warrior - CPT Jennings

Appendix 1: Dynamic Terrain - Virginia To

Annex F: Unmanned Aerial Vehicle - Steve Yerby

Annex G: Scout Vehicle - Dave Kearney

Annex H: SIMITAR - John Wasson

Annex I: Night Vision Simulation - Max Lorenzo

Annex J: Virtual Sand Table - MAJ Vaglia

Annex K: Virtual Retinal Display - Mark Shulz

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Annex L: Virtual Maintainer - Kelvin Nunn

Annex M: Telemedicine - CPT Chand

Annex N: Theater

Appendix 1: Visualization Plan - Randy Noble

Appendix 4: Script & Storyboards - Mike Collins

Annex O: Force XXI (FP) TOC - MAJ Cash

Appendix 1: Synthetic Battlefield Environment - Dan Fugit

Appendix 2: Unmanned Aerial Vehicle - Steve Yerby

Appendix 3: Log Anchor Desk - Allen Hardison

Annex P: CLCGF - Jim Pittman

Appendix 1: Battlefield Planning and Visualization - CPT Jones

Appendix 2: Aviation - Matt Arnold

Annex Q: Communications - Joe Jennings

Appendix 1: IDREN - Phil Dykstra

Appendix 2: Distributed Communications - Joe Jennings

Annex R: CD ROM - Don Steele

18. Mr. Wren explained how the round-robin would be set up and distributed check-off forms to the various proponent POCs. POCs rotated through each station:

a. Station A - Reviewed the Cotillion Ballroom layout and exhibition service requirements, lightboards (when applicable), and all equipment and/or services required of Lockheed Martin.

b. Station B - Reviewed simulations and theater support requirements and connectivity.

c. Station C - Reviewed theater script and data capture plan (if applicable) and verified planned or completed inputs to the CD ROM.

d. Station D - Reviewed the communications plan and coordinated all remaining planned actions and tests.

e. Station E - Reviewed Technical Concept Plans, Concept Briefings, and funding status, as appropriate.

19. After all proponents had completed the round-robin, LTC Brown reconvened the general session. The meeting was then opened for general discussion and questions.

20. The next IPR (IPR # 8), previously planned to be held in Washington, D.C. will now be held in Orlando, Florida. Dates are unchanged from previously announced: 27-28 August. IPR #8 will convene at 1300 hours, 27 August (Tuesday), in the conference room of the Sheraton Hotel.

Evening work session(s), as usual, may be required. The IPR is scheduled to close at 1200 hours on 28 August (Wednesday). The Sheraton Hotel is located at the corner of Alafaya Road and E. Colonial Drive,

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Orlando, Florida. The hotel phone number is (407) 658-9008.

21. There being no further business, LTC Brown thanked everyone for their efforts and closed the IPR at 1150 hours.

22. If you are missing gold rimmed glasses (bifocals) in a brown case, please contact Ken Wren to discuss the enormous reward for their safe return.

23. Reminder: Lightboard illustrations are due to Mr. Ulf Helgesson NLT 14 August. Illustrations should be provided on SYQUEST cartridge (88mb or less) and done in ADOBE Photoshop 3.0 or earlier (Power MAC File). Lightboard text (in MSWord) is due NLT 7 August. In addition to the above, whenever possible, original artwork (not a copy) should be provided and will result in the best production results. Direct your questions to Ulf at (818) 883-3772.

24. For planning purposes: IPR # 9 is now scheduled for 25-26 September, at the Sheraton Hotel in Orlando, Florida. This is one day later than previously planned/announced.

25. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@monroe-emh11.army.mil (after 30 July -- wrenk@leav-emh11.army.mil).

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IPR #8**SUBJECT: Minutes of In Process Review #8 for Army Experiment III**

1. The eighth In Process Review (IPR #8) of Army Experiment III (AE3) was conducted 27-28 August 1996 at the Sheraton Hotel in Orlando, Florida. A list of attendees is at Enclosure 1.
2. LTC Kirby Brown opened the meeting at 1300 hours, 27 August, and welcomed all attendees to the meeting. He stated that this was to be a "working" IPR rather than a "conceptual" one; to determine status and fine tune as necessary. He then went over the IPR objectives:
 - a. Finalize the OSF Integration and Test Plan.
 - b. Finalize the Cotillion Ballroom layout.
 - c. Finalize the Data Capture Plan.
 - d. Finalize the Communications Plan.
 - e. Finalize the Transportation Plan.
 - f. Finalize the Move-in and Set-up Plan.
 - g. Ensure component plans are in synch.
 - h. Discuss exhibit operation and administration.
2. LTC Brown went over the agenda, explaining that the Tuesday afternoon session would be primarily devoted to reviewing the main project plans in detail, the evening session would be devoted to reviewing each individual component via a series of stations, and Wednesday morning would be used to address execution of the project at the AUSA convention and issue resolution.
3. Mr. Ulf Helgesson provided an overview of the exhibit's physical arrangement in the Cotillion Ballroom.
4. Mr. Joe Jennings introduced the Communications Plan and explained who would be presenting each part of the plan.
 - a. Mr. Phil Dykstra presented the Distributed Network status by site and component: (Indy, software, reachability, accounts) for Fort Sill (D&SABL), Fort Bliss (RTOS), Fort Benning (DBBL), SSDC/ARC, Fort Leavenworth (JVL), Bozeman (SIMITAR), and San Jose (UDLP). He also reported on the status of communication hookups at the OSF, the AUSA site, and at the Army Research Lab. He stated that network control still

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needed to be fine tuned between ARL and Lockheed Martin.

b. Mr. Randy Noble presented the status of VTC sites. The JVL is installed and operational. UDLP is scheduled to be brought online August 27-29; DBBL brought online September 3-5; and SIMITAR is scheduled for September 5-7. He addressed a possible problem with the Bozeman VTC's quality due to the fact that no TELCOM provides T1 lines in that area, only switched 56Kbs.

c. Ms Stephanie Neuman went over the leased lines network status, including ISDN connectivity, T1 line connectivity, and DSI connectivity. She identified emplacement status, coordination, and on-site POCs for each connection.

d. Mr. Randy Kubik presented a schematic of the local area network (LAN) that will be established in the Cotillion Ballroom. It will be comprised of three subnets: the Theater subnet, the FP TOC subnet, and the Stand-alones subnet.

e. Mr. Bob Edwards provided an overview of the AUSA Show Communications. He covered telephones, 2-way radios, and teleconferencing (for backup connectivity). He also presented the separate internal communications networks set up for the theater and the FP TOC. He identified the following POCs for show communications:

| | |
|------------------|--------------------------------------|
| Bob Edwards | Lead System Integration (System POC) |
| Randy Kubik | Network Communications |
| Mike Kalaf | Transportation, Move-in, Facilities |
| | Exhibit Structure |
| | Scenario Dry Runs |
| Tim Voss | SAFOR, DIS, Loggers |
| Steve Clay | ASAS, MCS/P, BPV |
| Stephanie Neuman | ISDN, DSI, T1 lines |
| | Stand-alone coordination |
| Jan Ksel | FP TOC |
| | CM and Data Files |
| Steve McCarter | Audio Visual |
| | Database and IGs |
| Blake Culpepper | Property Management/Logistics |
| John Campbell | Government Liaison |

5. Mr. Bob Edwards presented the final Operational Support Facility (OSF) Integration and Test Plan. Phase 1 (OSF Preparation) is August 26-30, Phase 2 (point-to-point Testing) is September 3-13, and Phase 3 (Long Haul Scenario Testing) is September 17-October 4. Masters of Ceremony will also rehearse during the scenario testing on 1-3 October.

6. Mr. Randy Noble updated the status of the theater. There will be 29 sources (30 with ASAS), including the VTC stations. He presented the

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System Configuration Plan and went over the status of staging construction and hardware/software.

7. Mr. Mike Kalaf updated the Transportation Plan for inbound and outbound shipping. The complete Plan was distributed prior to the IPR, so he only needed to confirm selected information. He also distributed self-adhering pre-addressed shipping labels for containers being shipped to the staging facility (Wares Van and Storage in Manassas, VA). He then went over the Move-in/Set-up Plan. The actual move-in of equipment, construction of exhibit walls, and installation of power and communications will be a carefully orchestrated series of sequential deliveries and events commencing at 1400 hours, 9 October, and continuing around the clock until 2300 hours, 11 October. Technical rehearsals begin at 0800, 12 October.

8. Mr. Mike Collins provided status of the theater script and highlighted those actions still required to complete the Data Capture Plan. The following sites are scheduled for data capture (at the OSF) and should be up and capable of providing their specific scene requirements on the dates indicated:

a. 12-13 Sep JVL, JVL/ITEMS, SIMITAR, Night Vision, BPV, and AcuSoft. VTC sites in JVL and Bozeman require soldier in BDUs.

b. 18 Sep DBBL, ARL, and UAV (if not accomplished on 29 Aug)

9. The IPR was temporarily adjourned for the evening meal break, reconvening at 1900 hours for the scheduled round-robin checks:

a. Station A Communications requirements and connectivity status.

b. Station B Physical (Cotillion Ballroom) requirements, lightboards, move-in, and transportation.

c. Station C Data Capture Plan and exhibitor badges.

d. Station D Issues/problems resolution, status check of all ongoing actions, and individual scripts.

10. The evening IPR session was completed at 2220 hours.

11. The regular IPR reconvened at 0800 hours, Wednesday, 28 August. LTC Brown updated and reviewed the agenda for the morning's session.

12. Mr. Don Steele thanked those who had been prompt with their input, then showed portions of the CD ROM that had been completed (vignettes and some experiments) and explained how the button bar along the bottom of the frames can be used to call up "factoids" or additional information.

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13. LTC Smart briefed on CD-ROM and Web Site security. Following a briefing to GEN Reimer on the overall AE3 project and the CD-ROM, the CSA asked that "someone in the business" ensure we were not "shooting ourselves in the foot" with the CD. His concern was the quantity of information it provided from a single source and the security of individual web sites. His comment resulted from a monthly computer incidents report provided by the Land Information Warfare Agency (LIWA). LIWA is currently standing up as an INSCOM office.

a. On the issue of quantity of information provided on the CD-ROM the question is: Does the compilation of so much unclassified information make the product sensitive? This is an OPSEC/CI issue and will require a command decision following a review of the CD.

b. LTC Smart told the participants that LIWA was provided a listing of web sites to be included on the CD-ROM and they would, within their current resource constraints, provide a vulnerability analysis of those sites. LTC Smart recommended participants speak with their web managers about requesting LIWA or DISA conduct a vulnerability assessment of their site. POCs to request an analysis are: (LIWA) LTC Bob Vrtis or Brian Purdy at (703) 706-1462/2266 or Rob Karas (800) 357-4231. If a site is identified as having a security problem and that problem is not corrected before the master CD is produced or the command does not acknowledge and accept the risk, the site will be removed from the CD.

c. LTC Smart handed out a list of LIWA recommendations for web managers to help with site security. If you need a copy of these recommendations, contact Ken Wren and he will fax you a copy.

14. LTC Brown reviewed all issues gleaned from the previous evening's round-robin checks:

- a. Army Enterprise self-move-in.
- b. Aviation CD ROM input/data to AcuSoft.
- c. BPV SGI MAX impact machine.
- d. JVL 2nd T1 line status/MCS-P data pass.
- e. FP TOC two more Indys for M-Bone.
- f. Tele-Med lightboard pictures.
- g. UDP Indy M-Bone.
- h. MITRE John Madden Pen.
- i. UAV Payload view data logger.

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15. LTC Brown then explained how the exhibit at AUSA would be operated:

a. Show times Theater shows will normally be scheduled every half hour beginning at 1100 hours on Monday, 12 October, and at 0900 hours on Tuesday and Wednesday. The last theater show on each day will be scheduled at 1900 hours. The FP TOC presentation will follow the theater show, starting every half hour (on the hour and half hour). The last FP TOC presentation on each day will start at 1930 hours. On Monday, there will be no 1600 theater show, nor follow-on FP TOC show at 1630. These times are blocked out for personnel breaks and equipment repairs/tune-ups. On Tuesday and Wednesday, morning breaks will be scheduled at 1100 hours (theater) and 1130 hours (FP TOC) and afternoon breaks scheduled at 1600 hours (theater) and 1630 hours (FP TOC).

b. Theater seating There will be three rows of 11 seats each and a back row of 13 seats for a total of 46 seats. The back two rows of seats (with best view) will be where VIPs are seated. Another 5 seats (closest to the theater entry) will be reserved on a regular basis for late-coming VIPs or unexpected "tag-alongs." Seats not reserved for VIPs will be available to the general public.

c. VIP scheduling All VIPs will be scheduled through the DAS Strategic Communications Working Group (LTC Smart is AE3 POC). Visits will be by show and integrated with the general public whenever possible. VIPs will view stand-alone displays if waiting for the theater (because the shows are on a set schedule). We will adjust if we find that this plan does not work.

d. Masters of Ceremony (LTC Neil Fay, LTC Phil Macklin, MAJ Sheila Taylor, MAJ Rick Platt, and CPT Ed Jennings) MCs are responsible for greeting the crowd at the theater entrance, narrating the theater show, emptying the crowd from the theater and loading them into the FP TOC, answering questions immediately after the FP TOC presentation, exiting the crowd to the stand-alone area, and being available for individual questions. MCs will rotate, normally taking each 4th theater presentation.

e. Visitor Flow Visitors will enter the Cotillion Ballroom and visit the stand-alone displays until theater show times (on the hour and half hour). Scheduled VIPs will be escorted to the reception area where a VIP handler will pick up the group and give a quick overview of the exhibit before leading the group to the show. At the designated show time, the theater doors will be opened and the crowd ushered in. Five minutes after the doors are opened, the theater presentation will commence and last for 20 minutes. At the conclusion of the theater presentation, the MC will lead the crowd from the theater into the FP TOC (5 minutes available for transition) and introduce the FP TOC spokesperson. The FP TOC presentation will begin on the hour/half-hour

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and last 20 minutes. At the conclusion of the FP TOC presentation, the MC, in conjunction with the FP TOC spokesperson, will answer any questions (5 minutes available) and then lead the crowd out of the FP TOC area in time for the follow-on crowd and its' MC from the just completed theater presentation to move into the FP TOC area. Those exiting the FP TOC presentation are then free to start/finish their viewing of the stand-alone displays.

f. Cotillion Ballroom Rehearsals Scheduled as follows:

Friday 11 October:

0900-1600 MC training and rehearsals

Saturday 12 October:

1400 Full scope rehearsal (untimed)

1900 Full Dress rehearsal (untimed)

Sunday 13 October:

1300 - 2000 Timed Full Dress rehearsals

1530 CSA Walk-through (tentative time)

1800 Escort orientation

g. LTC Brown has established an operational on-site organization for control of activities in the Cotillion Ballroom:

VIP Handlers: LTC Smart, LTC Fernald, LTC Geddes, Mr. Joe Jennings, Mr. Jim Calpin, and Bill West. (LTC Smart will also be the VIP scheduler.)

Operations Cell (firemen): Ken Wren, Mike Collins, and John Campbell

Reception Desk: Sue Powers

Technicians: Bob Edwards and his cast of thousands

h. The operations cell will always be in contact (via walkie-talkies) with LTC Brown and Bob Edwards. Anyone needing to contact either LTC Brown or Bob Edwards can do so through any member of the Operations Cell.

i. Sue Powers (at the Reception desk) will assist visitors, record/pass messages, and store a small supply of CD ROMS. She will be the POC for Exhibitor Badge issue and maintain the AE3 notification roster. All POCs should report their place of lodging and telephone number to Sue as soon as possible after arriving in Washington D.C.

j. Daily Meetings Primary POCs only will meet daily at 15 minutes prior to start time. There will also be an all-hands meeting at 2000

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hours daily. Meeting may be held in the theater and involve remote sites (VTC).

k. Security Hotel guards will come on duty at 1800 hours Friday, 11 October. Once guards are posted, access to the convention area will be by badge only. AE3 badges will be distributed starting on Thursday, 10 October. Special badges allowing escort of unbadged visitors will be available as required from Ken Wren.

l. Breaks and Storage Areas Individual displays/exhibits must coordinate their own personnel break schedules. A break area and an area for storage of personal gear will be designated in or near the Cotillion Ballroom.

m. Filming and Photos Still photo and video shots will be taken after the CSA's walk-through on Sunday, 13 October. There will be other occasions when photos will be taken during the exhibit's operation, but there will be no late-night after-hours photo or filming sessions.

n. Dress Code Starting at 0800 hours Monday, 14 October, through COB Wednesday, the following dress requirements will be in effect: MCs, VIP escorts, and display spokespersons will wear Class A uniform (prepared to go to Class B if so directed); civilians will wear coat and tie; working technicians will wear casual-business attire; and soldiers participating in the exhibit will wear the BDU. Common sense will rule requests for exception should be directed to LTC Brown.

o. Rules of Conduct Displays are to be manned at all times during posted operating hours; there will be no visible eating or drinking in the Cotillion Ballroom by AE3 personnel during posted operating hours; smoking will be in designated areas only (outside on loading docks); no personal gear should be visible in the display area; and there should be no unnecessary loitering of non-visitors in the display areas.

16. LTC Brown then opened the floor to general discussion of issues and answered all questions. The following general guidance was given: After you bring up your networks (especially the M-Bone), leave them on.

17. Dates for the next IPR (#9) are as previously announced: 25-26 September. IPR #9 will convene at 1300 hours, 25 September (Wednesday), in Lockheed Martin's Operational Support Facility (OSF), Orlando, Florida. Evening work session(s), as usual, may be required. The IPR is scheduled to close at 1200 hours on 26 September (Thursday). If you have not yet faxed a visit request (for an access badge to the OSF) contact Ken Wren and he will fax you a copy of the form that must be completed and faxed to Lockheed Martin to obtain the access badge. If you plan to stay at the Sheraton Hotel located at the corner of Alafaya Road and E. Colonial Drive, the hotel phone number is (407) 658-9008. The number for the Holiday Inn - UCF (12125 High Tech Ave) is (407) 275-9000.

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18. LTC Brown announced that there is no requirement for POCs representing the following displays/areas to attend IPR #9:

- Depth & Simultaneous Attack Battle Lab
- Army Enterprise
- Log Anchor Desk
- Scout Vehicle
- Tele-Medicine
- Unmanned Aerial Vehicle
- Virtual Maintainer
- Virtual Retinal Display

19. IPR #9 will be devoted to reviewing the testing and integration of the various pieces that comprise the Theater and the FP TOC. This IPR will be conducted in the OSF high bay. Those stations hooked into the VTC will participate by VTC.

20. There being no further business, LTC Brown thanked everyone for their efforts and closed the IPR at 1045 hours.

21. Reminder (for stand-alones only): If you have not already provided a copy of your planned display "pitch" to LTC Brown, you need to do so now.

22. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@leav-emh1.army.mil.

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IPR #9**SUBJECT: Minutes of In Process Review #9 for Army Experiment III**

1. The ninth In Process Review (IPR #9) of Army Experiment III (AE3) was conducted 25-26 September 1996 at and from Lockheed Martin's Operational Support Facility (OSF) in Orlando, Florida.
2. LTC Kirby Brown opened the meeting at 1300 hours, Wednesday, 25 September, and explained to the participants how and from what locations the various portions of the IPR would be conducted.
3. A video teleconference was then conducted in the OSF high bay with the Joint Virtual Lab (JVL) at Fort Leavenworth, Kansas, the Dismounted Battlespace Battle Lab (DBBL) at Fort Benning, Georgia, and the SIMITAR project at Bozeman, Montana. This conference was held in the presence of the Lockheed Martin integrators and all participants were given a chance to report the status of their integration and identify any problems being encountered. General consensus was that everything was moving toward successful completion and only minor "tweaks" were needed.
4. LTC Brown also teleconferenced via video with the UDLP (Streamlined Acquisition) in San Jose and discussed their status and rehearsal.
5. A teleconference call was placed via speaker phone from an OSF conference room to MAJ Al Gammons (FP TOC) and Mr. Dan Fugit (SSDC MD-BIC). Mr. Mike Kalaf was present to discuss the move-in/out plan and Mr. Bob Edwards handled integration issues. There was some initial confusion because the FP TOC was also using the same line to conduct rehearsals and testing, but the FP TOC agreed to move to another line while the IPR was being conducted. Problems with the DSI node were identified. LTC Brown asked Mr. Phil Dykstra and Ms Virginia To (both at ARL) to develop recommended solutions and report same the following day.
6. A schedule for the rehearsals to be conducted 30 September through 3 October was published and distributed to all participants on site and via fax to the distributed locations. The rest of the day was devoted to fine tuning the script, theater integration, theater rehearsals, and working off-line to address individual problems as they arose.
7. The IPR reconvened at 0830 hours the following morning (Thursday, 26 September). Mr. Randy Noble updated the status of theater integration and Mr. Mike Kalaf presented a report on the latest plans for transportation, move-in, and move-out. The move-out will be particularly challenging due to the amount and configuration of equipment that must be removed from the Cotillion Ballroom in a very short span of time. LTC Brown adjusted the theater and FP TOC show times as follows: The theater will conduct two showings on Wednesday from 1800-1900 via "data-logger"/video tape, closing at 1900 hours; the FP TOC will conduct

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its last showing at 1830 closing at 1900 hours; the stand-alone displays will close on or about 1930 hours. An all hands meeting will be conducted at 1935 hours with tear-down commencing at 2000 hours. This change provides a high probability of meeting current hotel NLT move-out schedule by freeing up much of the theater and FP TOC electronic equipment for earlier tear-down and preparation for transport. It was generally agreed that this would make it possible, but not easy, to meet the move-out deadline.

8. A teleconference was conducted via speaker phone with Mr. Phil Dykstra and Ms Virginia To at ARL. Mr. Joe Jennings, Mr. Randy Kubik, Mr. Bob Edwards, and Ms Stephanie Neuman were on site. Several possible solutions to the DSI problems being encountered by the FP TOC were discussed and a way to reconfigure and reroute data was identified as the best solution. Mr. Dykstra accepted responsibility to resolve the problem.

9. A teleconference was conducted with the stand-alone displays to report/update status and clarify any issues or problems encountered.

Unmanned Aerial Vehicle (UAV) and Virtual Sand Table (VST) representatives participated on site. Army Enterprise, Virtual Maintainer, and Scout Vehicle participated via the teleconference line.

Mr. Ulf Helgesson was also on line. Tele-Medicine and Virtual Retinal Display (VRD) did not participate, but unresolved issues or problems are not anticipated. Everyone was in consonance with the transportation and move-in/out plans.

10. The teleconference line was left open for any other AE3 participants to identify and/or discuss issues. There being no further input received, the line was closed and the IPR adjourned at 1145 hours.

11. LTC Brown reminded all participants that everyone must make an extra effort to be online and ready for next week's full-up rehearsals (1-3 Oct) and especially during setup and on-site execution during the period 10-16 October. It is also not too early to start working on your input to the AAR.

12. Washington D.C. rehearsal schedule will be put out via M-Bone and e-mail during the setup time. It is imperative that everyone be on active standby during the period 9 and 10 October. Stay ready.

13. POC for this action is LTC Brown. Recorder was Ken Wren, at (913) 684-4042, DSN 552, FAX 3566, e-mail: wrenk@leav-emh1.army.mil.

Monday's Schedule

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 1100 | 1105 | 1125 | 1130 | 1150 |
| 1130 | 1135 | 1155 | 1200 | 1220 |

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| | | | | |
|-------|------|------|------|------|
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| 1500 | 1505 | 1525 | 1530 | 1550 |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| BREAK | | | | |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | 1900 | 1920 |
| 1900 | 1905 | 1925 | 1930 | 1950 |

MIDWAY (Stand-alones) Closes o/a 2030

Tuesday's Schedule

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 0900 | 0905 | 0925 | 0930 | 0950 |
| 0930 | 0935 | 0955 | 1000 | 1020 |
| 1000 | 1005 | 1025 | 1030 | 1050 |
| 1030 | 1035 | 1055 | 1100 | 1120 |
| BREAK | | | | |
| 1130 | 1135 | 1155 | 1200 | 1220 |
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| 1500 | 1505 | 1525 | 1530 | 1550 |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| BREAK | | | | |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | 1900 | 1920 |
| 1900 | 1905 | 1925 | 1930 | 1950 |

MIDWAY (Stand-alones) Closes o/a 2030

Wednesday's Schedule

Date: 17 January, 1997

| Enter Theater | Theater Show | Exit Theater | TOC Show | Show Over |
|---------------|--------------|--------------|----------|-----------|
| 0900 | 0905 | 0925 | 0930 | 0950 |
| 0930 | 0935 | 0955 | 1000 | 1020 |
| 1000 | 1005 | 1025 | 1030 | 1050 |
| 1030 | 1035 | 1055 | 1100 | 1120 |
| BREAK | | | | |
| 1130 | 1135 | 1155 | 1200 | 1220 |
| 1200 | 1205 | 1225 | 1230 | 1250 |
| 1230 | 1235 | 1255 | 1300 | 1320 |
| 1300 | 1305 | 1325 | 1330 | 1350 |
| 1330 | 1335 | 1355 | 1400 | 1420 |
| 1400 | 1405 | 1425 | 1430 | 1450 |
| 1430 | 1435 | 1455 | 1500 | 1520 |
| BREAK | | | | |
| 1530 | 1535 | 1555 | 1600 | 1620 |
| 1600 | 1605 | 1625 | 1630 | 1650 |
| 1630 | 1635 | 1655 | 1700 | 1720 |
| 1700 | 1705 | 1725 | 1730 | 1750 |
| 1730 | 1735 | 1755 | 1800 | 1820 |
| 1800 | 1805 | 1825 | 1830 | 1850 |
| 1830 | 1835 | 1855 | | |

MIDWAY (Stand-alones) Closes o/a 1935